The Builder.

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ILLUSTRATIONS.

Reredos, Catholic Apostolic Church, Gordon-square.—Mr. John Belcher, F.R.I.B.A., Architect ..... *Double-Page Photo-Litho.*
Working Drawing of Reredos, Catholic Apostolic Church, Gordon-square.—Mr. John Belcher, F.R.I.B.A., Architect ..... *Double-Page Ink-Photo.*
House at Oxted: Entrance Front.—Mr. R. A. Briggs, F.R.I.B.A., Architect ..... *Double-Page Ink-Photo.*
House at Oxted: Garden Front.—Mr. R. A. Briggs, F.R.I.B.A., Architect ..... *Double-Page Ink-Photo.*

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Recent Excavations on the Western Slope of the Acropolis.—II.

WE retrace our steps to the Areopagos, and take next in order the buildings on the left-hand (east) of the main road. These are of no less importance and far less complex.

The building marked A (fig. 1, page 148 *ante*), is *probably* of Greek date, but its extent and attribution have not as yet been made out. Along the next portion of the road the rock of the Areopagos borders so closely that there is no space left for any building of importance to intervene. But, where the actual rock crops up there are marks of working in the rock, the only traces of several buildings that must have covered this corner of the Areopagos. In one place the markings indicate a circular structure which may possibly have been the Odeion which Pausanias mentions after the temple of Ares. This portion of the hill has not yet been completely cleaned out. At T (fig. 1), a small fragment of an early limestone wall has been found, but the remains are insufficient to make out any ground-plan. The building, whatever it was, abutted on the cross-road that climbs the steep incline almost due west, and that borders on the Dionyseion. That this cross-road was a public road is clear, both from the fact that its pavement has been renewed again and again, and also from the existence of a drainage canal beneath it.

This brings us to what is topographically, historically, and mythologically the most important discovery of the whole excavations—*i.e.*, the triangular precinct marked Dionyseion, of which we give an enlarged plan (fig. 2). This sanctuary—for sanctuary, as we shall see, it is—lies substantially lower than the roads by which it is bounded, and is surrounded by an ancient polygonal wall of limestone masonry, and measures about 560 square mètres. This wall is fortunately well preserved; it is marked in solid black lines on the plan, and must be carefully distinguished from the later quadrangular building superimposed, and drawn in double outline (marked Baccheion). There are, in fact, at this point no fewer than three periods of masonry to be carefully distinguished, and which are shown as marked on the left side of fig. 2.

These various periods can be clearly made out not only by material and character of masonry, but also by the different levels they occupy. In the early Greek work of period 1 the material is either a hard blue calcareous stone and the masonry polygonal, or Piræus stone built in quadrangular blocks. Of periods 2 and 3 the foundations only remain, and in period 3 stones of all kinds are built in, and held together with mortar. As regards the different levels, the floor of the ancient precinct (period 1) is 77·25 m. above the level of the sea, the latest (period 3) runs to a height of 79·60 m. Hence it is clear that the early Dionyseion had in Roman times got covered over with *débris* 2 mètres deep. The exact level of the early Roman buildings of period 2 cannot be determined, as the level of the floor cannot be made out.

We take the early precinct first, though, of course, it was found last, and, indeed, it owes its excellent preservation to the fact that it fell into disuse and was covered in at such a comparatively early date. The main features discovered are the precinct wall, a central altar, and, most important of all, a wine-press.

The precinct wall, owing to the fact that the precinct lay deeper than the streets by which it is surrounded, is, almost in its entire circuit, a supporting wall. Originally the difference in level was as much as 2 mètres, and this difference was augmented as time went on and the level of the roads got raised. At the north-west corner only is the precinct level somewhat higher than that of the road. The material of the wall consists throughout of polygonal blocks of blue calcareous stone, but the masonry is by no means of uniform excellence, or throughout of identical date. The difference in its character at various points can only be accounted for on the supposition that the wall underwent repairs at various periods. On the east and north side, where the higher level of the road caused substantial pressure, the wall is supported by buttresses, of which some still remain intact; only one can be certainly dated as of good Greek period; the rest from their indifferent masonry seem to have been added shortly before the ancient precinct fell into disuse.

It is remarkable that, in the whole circuit of the wall, there is no trace of any large entrance gate. The only feasible place is at the south end of the east wall, where there seems to have been a break, and the temple within the precinct is orientated to face this way; it seems likely that the gate stood here, and that at this point only the precinct was accessible.

Standing in the centre of the ancient precinct is the foundation in *poros* stone (3 by 10 m. square) of a large altar (fig. 3);

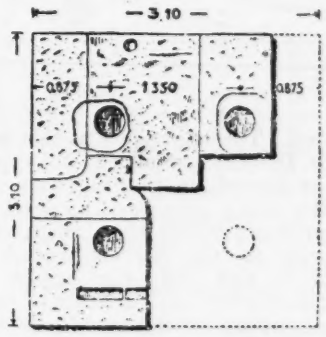


FIG. 3.—*Enlarged Plan of Base of Ancient Altar.*

in this foundation are four holes, 0·24 m. in diameter, and 0·10 m. deep. Of these, three remain and the fourth may be safely supplied. These holes were evidently intended for supports on which the actual table of the altar rested. Allowing that the table slab overlapped the supports about 0·20 m. we should get an altar slab of roughly 2 mètres square. This altar itself has undergone restoration, of which there are clear traces. These altar tables are familiar in vase paintings, and seem to have been specially in use in the worship of Dionysos—moreover, the actual altar slab of just such a table, 2·31 m. by 1 m., has been found in Attica, and an inscription states that it was dedicated to Dionysos Auloneus. An altar step of a similar character to this in the Dionyseion, and containing two round holes, has been discovered at Eleusis, and a partially-preserved inscription proves it to have belonged to an altar. Another important point remains. On the west step of the altar foundation a long hole is sunk in the stone. Its length is 0·49 m., its breadth 0·13 m., its depth 0·08 m. Close to it is a second similar hole, part of which is broken away. Its purpose is obvious. Both on the Acropolis and elsewhere in sacred precincts such holes are found, which served to contain stelæ, on which decrees, &c., were in-

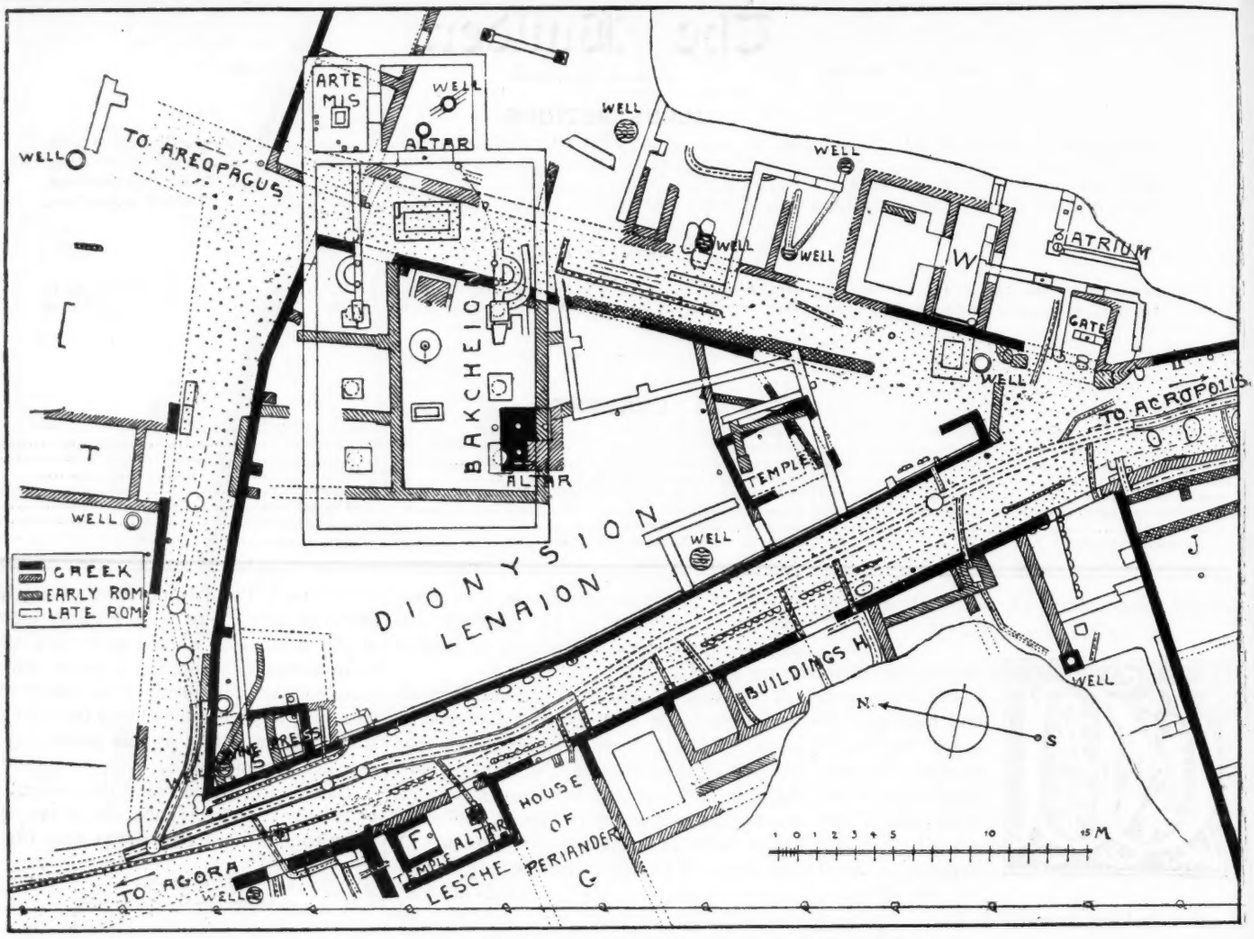


FIG. 2.—*Enlarged Plan of a Portion of the Site of the Excavations.*

scribed. The importance of this in relation to Dr. Dörpfeld's argument will appear later.

The date of the altar structure cannot be exactly fixed, but from its level and the material of which it is made, it clearly belongs to the earliest period of the precinct, and with this agrees the fact that a quantity of fragments of very early vase-paintings were found close beside it. The altar, though in the plan it seems involved in the wall of the Baccheion, has, of course, nothing to do with it. It was buried out of sight when the Baccheion was built, and the wall of the later structure went clean across it.

At the point marked S (figs. 1 and 2) a discovery was made which makes of the attribution "Dionyseion" a fact, not a theory. Here the excavators came on a structure so far unique in the history of discoveries; it is nothing less than a genuine ancient Greek wine-press. It consists of a walled-in space 4·70 m. by 2·80 m. This space is carefully paved with a mixture of pebblestone and cement, and is inclined to one corner at an angle of 0·25 m. At this lowest point is a hole through the boundary-wall, and outside, let into the pavement, is a large vessel, 0·50 m. inside diameter, quadrangular above, round below, which can have served no other purpose than to collect the juice pressed from the grapes above. It was, in fact, the κρατὴρ ὑπολήνιος which appears on vase paintings. This wine-press is in every respect exactly similar to the presses in use to-day among the Greeks. It should be noted that this wine-press shows clearly that at some time or another it was rebuilt. The later structure is smaller, and of course at a higher level, having been superimposed; the paved floor of both structures is clearly visible.

As regards the date of the earlier wine-press, it is important to note that the front wall of the Lesche, exactly opposite (on the other side of the road), is of precisely similar masonry, and on the same level. As the Lesche, we have seen, is of sixth century B.C. date, the wine-press, in its earlier phase, must be of approximately the same time. The later wine-press is at a level below the Baccheion, so must have been underground when that was built. It should be noted that below the earlier wine-press is a pavement of still earlier date, so that it is quite possible that could the Greek wine-press be in part pulled to pieces, a yet earlier structure might come to light.

We come last to the temple in the south corner of the precinct. It is of small size (3·96 m. by 5·40 m.), and consists of a quadrangular cella and a narrow pronaos. From its meagre proportions, it does not seem likely that the pronaos contained any columns. Inside the cella, fragments of an ancient mosaic pavement, made of round pebbles and mortar, have been found. The level of this pavement (78·50 m. above the sea) shows that it was constructed in relation, not to the floor of the ancient pavement, which is about one mètre lower, but to that of the two roads which bound the precinct at this corner. The masonry of the little temple is very ancient in character. The walls are of polygonal and the blocks are of calcareous stone, and on the west side of unusually large size. In the foundations of the side walls a few porous blocks occur. There are no steps serving as foundation to either cella or pronaos. Dr. Dörpfeld concludes that in all probability the temple is older than the temple of Dionysos Eleuthereus close to the *skene* of the theatre. This belonged to the time of Peisistratos; it is more carefully built than the newly-discovered temple, and has one step. The exact date cannot be fixed, but one thing is clear, it was preceded by an earlier building, two walls of which (marked in the plan) lie beneath its foundations.

The relation of the temple to the precinct is exceptional and noteworthy. It does not lie in the middle of the precinct, and moreover it is separated by a wall and a door that could be closed. The wall of separation is, however, apparently later than the temple, so that possibly at one time the temple stood free within the precinct. This peculiar relation is explicable on ritual considerations. The temple was possibly accessible at all times, whereas the precinct was normally closed.

We have here, then, as perfect a picture as possible of an ancient Dionysiac sanctuary, a temenos, a temple, an altar, a wine-press. Two further points must be noted as bearing on the question, *what* sanctuary of Dionysos we have here—the precinct has no entrance on to the main road, and within it no votive offerings of any sort whatever have been discovered.

How long this ancient Dionyseion remained standing cannot unfortunately be exactly determined, because the early Roman structure (marked on the plan in thin double lines) which superseded it, and may, indeed, have caused its destruction, cannot be dated. All that can be said is that the masonry remaining is roughly analogous to that of the foundations of the stone proskenion in the theatre at Athens, and that these belong to the first century B.C. It seems probable that this early Roman building was, like the later one, a hall for the Thiasos, or association of the Iobacchoi. Its plan, so far as it can be made out, corresponds with the later Baccheion, to which we now turn. The main building of this somewhat complex structure is the great hall of the Iobacchoi, a long space 18·80 m. by 11·25 m., with a quadrangular apse to the east. The building technique is by no means uniform on the west side, and in the foundations of the inner columns no mortar is employed, whereas in both walls and foundations on the east side mortar occurs. The structures in the middle aisle, which seem to be altars, are wretchedly built, and of the most miscellaneous material.

This main hall has two rows of four columns, the bases of which are for the most part preserved. They divide the hall into a wide central aisle and two narrow

side aisles. At the east end columns with no bases extend in arch-shaped fashion up to the door of the apse. The purport of the small semi-circular structures in the second intercolumnal spaces remains unexplained. Nor, indeed, is the meaning clear of the altar-like structures already mentioned, and which occur in the middle aisle. The main entrance to the hall was at the west end, opposite the apse. The apse must have had two doors, one to communicate with the main hall, the other with the adjoining sanctuary of Artemis. Within and near this apse several altars and a quantity of sculptures were found. Important among these remains is a large quadrangular altar, which has on three sides scenes relating to Dionysiac sacrifices worked in sunk relief. The technique of these reliefs is curious; the design is thrown on to the ground in careless experimental fashion, with little regard as to the space to be filled, but the figures of Satyrs, a goat, a bull, are full of life and a certain easy grace. These reliefs will shortly be published, so discussion may be reserved. On the fourth side is an inscription, effaced, but still legible — Κοροτρόφου παρὰ Ἄρτεμιν — in archaistic characters. The mention of Artemis is important, as we have another altar with the inscription Ἀρτέμιδος Ἐρείθου and a statue of the goddess was also found here. All three came to light in a small chamber adjoining the apse, in which there was an altar built of brick, and round the walls of which were a number of bases. We may, therefore, safely conclude that there was here close to the Baccheion, a late Roman shrine of Artemis, which, in all probability, succeeded to the early cult of Artemis ἐν Λίμναις. Below this Artemision is an early polygonal structure, which may be the primitive sanctuary.

In the apse close to an altar still standing upright, decorated with boukrania and fruit wreaths, and with an inscription unfortunately effaced, was the drum of a column which bore the now famous inscription of the Iobacchoi. This inscription, which is of the first mythological importance, has been published and fully discussed by Dr. Sam Wide ("Mittheilungen," 1894, p. 249).* It is likely to afford material for mythological controversy for some time yet, but this is not the place to attempt its further elucidation. Its importance for us consists in the fact that it is inscribed on a stele standing on a drum exactly similar to those still standing in the Baccheion. It, therefore, unquestionably belongs to the building. The inscription is surmounted by a pediment, in the centre of which is a krater, over it a boukranion, on either side a panther and a vine with bunches of grapes. The inscription contains, in 165 lines, for the most part admirably preserved, the statutes of the association known as the Iobacchoi. It dates about the third century B.C., and abounds with curious details as to this hitherto obscure cult. After the finding of this inscription, no doubt whatever remained but that the quadrangular building was the hall of assembly of the Iobacchoi.

A number of other sculptures of minor importance were found in the Baccheion. Some obviously belonged there, the subjects being Dionysiac, others may have been carried there from other shrines—*e.g.*, Kybele reliefs, statuettes of Pan, triple Hecates, &c.

On the opposite side of the road which bounds the Dionyseion to the east were found the walls and the pavement of a building of early Greek date. Its ground-plan is not yet made out in full, but it is of peculiar interest, as its pavement supplies us with what is probably the earliest extant Greek mosaic. The walls are so engaged with the pavement that both must be of the same date, and these walls are of early polygonal limestone masonry. The pavement is made of flat and round pebble stones, cut in half and polished. The colouring and patterns are of the simplest—circles, crosses, rhomboids; it would be hard to conceive anything more charming than the simplicity and delicacy of the effect. When a pail of water is thrown over the pavement the mosaic comes up as fresh and clear as though it had been laid yesterday. In two of the chambers of the building it is admirably well preserved. From the excellence of the work and the apparently large size of the whole structure Dr. Dörpfeld inclines to think we may have here a public rather than a private building, but he pronounces as yet no definite opinion.

Last on the west side of the road lies a building that came to light nearly three years ago, and to which we have more than once drawn attention, *i.e.*, that marked on the plan as the Asklepieion (see fig. 1, page 148). The precinct borders on the footpath leading direct up to the Acropolis, and its boundary walls are of good polygonal masonry. We have noted before the sculptures and inscriptions found there, and as the sanctuary does not affect the immediate problem we need not recur to it. It was hoped that as Asklepios and the Eleusinian divinities appear together on reliefs and their cults were connected at Athens, this Asklepieion might prove to be an annexe of the Eleusinion; this hope, so far, has proved fallacious. Into the mythological importance of the Asklepios heroes named we need not enter.

We pass now from fact to theory, from the discoveries actually made to—

3. *Dr. Dörpfeld's interpretation of the fresh material, the new interpretation he gives of the Thucydides passage, and his revolutionary view of the topography of ancient Athens.*

For the present argument we may set aside all the subordinate discoveries, the Greek and Roman houses, the unnamed buildings and precincts, even for the present the Asklepieion, and focus our attention exclusively on the two main discoveries:—

1. The water-course system;
2. The precinct of Dionysos;

And first, the water-course system. No one disputes the fact that Dr. Dörpfeld has discovered traces of a primitive local water supply connected with the chambers at P and O, and with a number of wells. Further no one denies that he has traced out a water-course of the sixth century B.C. which debouches close to the sources of the primitive water supply, and at that date was carried no further. Few, after examining the stones on the spot, will doubt that, built into the late Roman house, are remains of a fountain structure.

Dr. Dörpfeld's explanation is briefly this. As indicated on fig. 1, the undoubted primitive water-supply is the ancient fountain Kallirrhoë, the aqueduct is that made by Peisistratos, and supplies the later fountain-house of the Enneakrunos with which Peisistratos adorned the market-place. The stones found in the Roman house actually belong to that very Enneakrunos which once stood on its site. According to this view, we have to picture the primitive Kallirrhoë issuing from the Pnyx rock immediately in front of the citadel gate. Down the narrow path facing it came the maidens to fetch water for all their household uses. The natural spring was at first abundantly adequate for the supply of the small community. The spring had no special ritual sanctity; it was in use simply because it was near at hand. As time went on, and the little city grew year by year, new wells were sunk, water gathered from fresh springs, till at last the resources of even this marshy land were drained. Then came Peisistratos with an enterprise worthy of his fame. No surer road to popularity than by providing the city with a water-supply at once adequate and splendid. He built the aqueduct, he changed Kallirhoë into Enneakrunos; it was possible now to plant the agora with plane-trees, and the whole city blossomed out afresh. The aspect of the fountain-house Peisistratos built may in main outline be reconstructed from the many black-figured vases with scenes of water drawing; to one of these we drew attention in this relation in a recent issue. Probably in early Roman days this Enneakrunos underwent substantial alterations contemporaneous with the alterations that took place in the reservoir N already noted. In late Roman times the reservoir and Enneakrunos fell wholly into disuse, the agora had shifted to the north of the Areopagos, and there was no longer any need for a large water-supply at the gate of the citadel. The conduit was extended by pipes to the new Roman agora, and the marks of this extension can still be seen in the Pnyx rock; indeed, these marks were at first mistaken for traces of the original conduit. That the Enneakrunos was completely destroyed is clearly shown, of course, by the fact that fragments of its masonry were built into the late Roman house already discussed. But down to at least the days of Pausanias, and probably much later, the ancient spring Kallirrhoë was still in use for special sacred purposes—the marriage bath and the like—and its scanty waters were supplemented by an artificial conduit. Just such an arrangement is found at Delphi; the sacred well Castalia had but a scanty and intermittent indigenous water supply; that the faithful might not be disappointed, it was supplemented by an artificial conduit of less holy water.

The main arguments by which Dr. Dörpfeld supports his theory are two: first, what we may call the *natural probability of the site;* second, *its accordance with the narrative of Pausanias.* As regards the first, it is obviously more natural that the well of the primitive rock citadel should be close to the city gates. To fetch water for ordinary purposes from a Kallirrhoë on the Ilissus would have been almost impracticable; the distance does not perhaps look serious in a map, but let anyone try on a hot day bringing even a moderate-sized can of water from the Ilissus to the Propylaea, and he will probably be inclined to renounce on the spot the Enneakrunos episode. That there was a Kallirrhoë on the Ilissus in late days and that the Enneakrunos was put there by late lexicographers, no one doubts; but that was by a natural confusion when the city had shifted south, and the water supply, even of the Roman agora, was comparatively unimportant. Now as a native spring, a number of wells and an artificial conduit, together with fragments of a fountain, have come to light just in front of the citadel gate, unless there is strong reason to the contrary, it seems likely that these collectively represent Kallirrhoë Enneakrunos. The strong reason to the contrary is of course the passage of Thucydides, to which we shall presently return.

Second, *the accordance of the site with the narrative of Pausanias.* Pausanias, in his passage through the agora, has reached the Areopagos, and notes the Temple of Ares, which cannot, of course, be separated from the hill of the god. After several statues grouped near and about he passes to the Odeion, the Enneakrunos, the Temples of Demeter and Kore, and, further away, the Temple of Artemis Eukleia. Dr. Dörpfeld has not yet found the Odeion, he still hopes it will come to light, and with it the ancient orchestra, on the site of which this later Odeion was probably built. But it will be admitted on all hands that the site he chose for the Enneakrunos is just at the point which Pausanias would naturally have reached. Again, he has *not* found the Eleusinion, but if his theory be right it must be within the curve of the Panathenaic Way as it comes round to the left. Clement of Alexandria (Protrept., p. 13) speaks of the Eleusinion as *beneath* the Acropolis; unfortunately, he does not say in what direction. This, however, is made clear by Philostratos in his description of the Panathenaic procession. He says (Vit. Soph., II., i., 5) that the ship starting from the Peramerkos sailed up to the Eleusinion, and having made the circuit of it (καὶ περιβαλοῦσαν αὐτό) passed

* Since the above was written, a second important discussion of this inscription has appeared in "Orpheus," by E. Maass, pp. 18-71.

the Pelasgikon. The supporters of the "Enneakrunos Episode" have to take the ship right down to the Ilissus, a proceeding as unmeaning as inconvenient. The Eleusinion may yet be found, but a considerable portion of the probable site has been explored without results, and as the rock crops up very near to the surface, it is to be feared no traces will be found.

The question of the Enneakrunos is intimately bound up with the second important discovery—that of the *Dionyseion*. Here it will be remembered that the facts ascertained are that an ancient precinct of Dionysos has been discovered, and above it an assembly hall of the Iobacchoi, known to be such by a well-preserved inscription. That the ancient precinct belonged to Dionysos no one doubts, as, though no inscription of its date has come to light, the presence of the wine-press places the attribution beyond dispute. Further among the later sculptures and inscriptions there is, as has been seen, sufficient evidence that a Roman sanctuary of Artemis was at least near at hand.

Dr. Dörpfeld believes that in the ancient precincts he has found the Lenaion or Sanctuary of Dionysos *ἐν Λίμναις* (in the Marshes), the seat of the most primitive cult of Dionysos at Athens. The site of the Lenaion has been long disputed. The old orthodox view (based again on Thucydides) was that the Lenaion was somewhere near the present theatre, to the south of the Acropolis, and that the marshes in which it lay were in the district watered by the Ilissus. To this view, long ago, Dr. Dörpfeld took exception, on the ground that this site was not and could not be marshy—it is too thoroughly drained by the Ilissus; he did not, however, at once think of the west slope of the Acropolis, because till the excavations began its marshy character was not apparent, nor was it known to be the central point of a system of local springs as well as the great artificial conduit. Since the diggings took place it is sufficiently apparent that the water is caught and confined by the ridge of the Pnyx, as it meets the Areopagos, and that but for artificial drainage, the hollow between must of necessity be a marsh-land.

Dr. Dörpfeld's next point is the *argument from literary sources*. The temple *ἐν Λίμναις* we know to have been identical with the Lenaion. Hesychius (sub voc. *Λίμναι*) tells us expressly that the Limnai was a place dedicated to Dionysos, at Athens, where the Lenaia were celebrated. It also bore the name Dionysion as we know from Isaeus (viii. 35). Dionysos Lenaios is the god of the wine-press, and the ancient precinct with its wine-press is admirably suited to his worship. Before the building of the great Dionysaic theatre festivals in honour of Dionysos went on in the ancient orchestra, which, according to one lexicographer (Tim. Lex. Plat.), stood near to the statues of Harmodios and Aristogeiton, and is, as we have seen, close to the Areopagos. This orchestra it is natural to bring into connexion with the Dionysaic precinct first discovered. Moreover, as Dr. Dörpfeld points out, the precinct is quite peculiar in character; it is carefully secluded from the main highway, and it contains no votive offerings. There was in Athens we know one ancient sanctuary of Dionysos which was opened but once in the year. In this took place the sacred marriage of the god with the wife of the archon Basileus, one of those primitive "sympathetic magic" ceremonies common to so many early peoples. In speaking of the oath taken by the Gerairai at this sacred marriage Demosthenes (c. Neairam, 76) says "they wrote it on a stone stele and set it up in the sanctuary of Dionysos by the side of the altar (*παρὰ τὸν βωμόν*) in the marshes, and the *stele* still stands there to this day, with its indistinct letters of the Attic type as a record of what was enacted; and it was on this account that they set it up in the most ancient sanctuary of Dionysos, and also the most holy—*i.e.*, that in the marshes—so that many people might not read what was written, for it is opened only once a year—on the 12th day of Anthesterion." The actual hole in which this ancient stele was set above Dr. Dörpfeld thinks he has found on the altar-foundation already described (Fig. 1). In a sanctuary of this kind, so rarely seen, works of art would naturally be absent, and Dr. Dörpfeld, seeking as he did this particular sanctuary, boldly prophesied that none would come to light. It was essentially a "mystery" sanctuary, with no tincture of the museum.

It may be added that distinct traces (sculptures, inscriptions) of a Roman Artemision have come to light, and these are significant, not for their own sake, but because we know that in this same district of the Limnae there was a sanctuary of Artemis *ἐν Λίμναις* (Schol. Call. ad Dian. 172); this Dr. Dörpfeld believes he has found in the precinct surrounded by polygonal walls close to the Dionyseion.

So far, all seems to fit in admirably. Pausanias is manifestly on the side of Dr. Dörpfeld; but there remains the old crux of the passage of Thucydides. If Thucydides said, as he is supposed to have said, that the shrines he enumerated, *i.e.*, that of Zeus Olympios the Pythion, the shrine of Ge, and that of Dionysos *ἐν Λίμναις*, lay to the south, clearly they cannot be excavated due west, or, still worse, north-west. We have given above a translation of the passage, but the original must be quoted (II., 15). *Τὸ δὲ πρὸ τούτου ἡ ἀκρόπολις ἡ νῦν οὖσα, πόλις ἦν, καὶ τὸ ὑπ' αὐτὴν πρὸς νότον μάλιστα τετραμμενόν· τεκμήριον δέ· τὰ γὰρ ἱερὰ ἐν αὐτῇ τῇ ἀκροπόλει . . . καὶ ἄλλων θεῶν ἐστι καὶ τὰ ἔξω πρὸ; τοῦτο τὸ μέρος τῆς πόλεώς μᾶλλον ἵδρυται*—then follows the enumeration of the shrines as above. *Πρὸς τοῦτο τὸ μέρος*, literally *towards this part*, has always been taken as meaning *towards the south*. This interpretation has been, if not caused, at least supported, by the fact that the familiar accredited sanctuaries of Dionysos and Zeus Olympios are to the south. Dr. Dörpfeld takes the passage quite otherwise; the gist of the whole passage, according to him, is not in which direction the old city and its shrines lay, but the fact that what later was called the Akropolis was then the whole *polis*, and the ancient shrines lay either within the *polis*, or, if *ἔξω*, *i.e.*, outside the gates, close up to the *πόλις*. No better description could be found for the lie of the precinct that Dr. Dörpfeld calls that of Dionysos *ἐν Λίμναις*. It is *ἔξω*, but unmistakably *πρὸς τοῦτο τὸ μέρος*, lying close up to, creeping up the hill "towards the" citadel, the ancient *πόλις*. Now, that there was a Pythion and a sanctuary of Ge close to the temple of Zeus Olympios, to the south-east of the Acropolis, no one denies. We have it on the express testimony of Pausanias. But this Pythion could not by any stretch of controversy be called *ἀρχαῖον*. The old Pythion lay (and it was Dr. Dörpfeld who first placed it there) under the north-west corner of the Acropolis; it may therefore be said to have been *ἔξω*, and certainly *πρὸς τοῦτο τὸ μέρος*, close to the citadel. Ge presents no difficulty, as Pausanias saw her sanctuary just before he entered the Propylæa. But what of Zeus Olympios? Here one thing is plain: the sanctuary near the Ilissus could not be called "ancient"; but was there another, and can it be placed at the west end of the Acropolis? Strabo, speaking of Harma in Attica, says, "There the proverb took its rise, 'When the lightning has flashed through Harma.' The Pythiastai, as they were called, take note by the order of the oracle of any lightning that flashes when they are looking in the direction of Harma, and when they see it they dispatch the sacrifice to Delphi. They have to keep watch for three months, three days and nights in each month, at the altar of Zeus Astrapios, the sender of lightning. This altar is in the wall between the Pythion and the Olympieion." Now it is obvious that the Pythiastae could not have a much worse place for observation than the low-lying land of the Ilissus, nor a much better than the north-west rock of the Acropolis, which looks direct to Harma.

Therefore, on this supposition, the ancient sanctuaries are all re-found complete, just in the order going downwards from the citadel in which Thucydides names them: the sanctuary of Zeus Olympios, the ancient Pythion, the shrine of Ge, the precinct of Dionysos, and "not far away" the Enneakrunos; so long as we can accept Dr. Dörpfeld's reading of the words *πρὸς τοῦτο τὸ μέρος*.

NOTES.

THAT success may attend the bold attempt to found an Architectural School at Liverpool under the wing of Victoria University cannot fail to be the wish of all who are interested in the progress of architecture or of architects in this kingdom. The especial boldness of the scheme lies in the provision of a course of education for architectural tyros prior to their entry into an office, which is, as far as we know, the first attempt in England to place architectural education in a line with the system universally adopted on the Continent and in America. Of the advantage to the student in this method there can be no question, as he receives, just at the period of his greatest ignorance, the maximum of individual attention and regular systematic instruction. The value of a trained pupil to his future master is also, without a doubt, far beyond that of a raw, inexperienced youth, fresh from school. No one who has conscientiously endeavoured to help on a new pupil in his office would hesitate to prefer one who had received a couple of years' steady tuition in such a school as that now started in Liverpool. Indeed, it would be an excellent investment for any Liverpool architect to pay the fees of his pupils, and send them to the school for the first two years of their articles. The saving of his own time and of spoilt work, and the increased value of his pupils' services for the remainder of their term would amply recoup him for the expenditure of the school fees. On another aspect the outlook for the Liverpool School is one of happy augury for the art of architecture. The composition of the staff, with Mr. F. M. Simpson for director, Mr. Charles J. Allen, Mr. R. Anning Bell, and Mr. J. Platt, is a guarantee that an earnest endeavour will be made to institute and maintain a close connexion in the training of architectural students with what are popularly termed "the allied arts," and may rather be expressed as the comprehension of art, as a whole, of which architecture is but one part or form of expression. The student-architect is intended to learn something of the methods, the capabilities, and the limitations of sculpture, painting, modelling, decorative painting, wrought-iron work, and wood-carving. The course of instruction is arranged to occupy two years, during the first of which the student is instructed in freehand drawing and modelling, geometrical drawing and perspective, history of architecture, buildings, materials, and construction, and elementary mechanics. The fee for the complete course is 25*l.* for the session of three terms, and this admits the student to all lectures by the Professor of Architecture or his Demonstrator, to the architectural studio whenever open (from 10 a.m. to 4 p.m. every weekday, except Saturday, and from 7 to 9 p.m. on four evenings of the week), to the lectures by the other Professors, and to all the classes in the Applied Art Section for which they have time. Provision is also made for students already in offices, who are unable to give more than a part of their time to the course, by the establishment of afternoon and evening lectures and instruction both in the architectural studio and in the crafts school.

THE meeting of the British Association next week at Ipswich hardly promises to be one of the most brilliant in the annals

of the Association. Ipswich is a smaller town than the Association has usually selected for its meetings; and though it was a still smaller one when the Association last met there forty-four years ago, it was supported on that occasion by an exceptionally brilliant collection of eminent men of science, with a very eminent astronomer as President. Among the papers to be read on subjects in which we are specially interested is one by Professor Henrici on "The Teaching of Geometrical Drawing in Schools"; not, we presume, in Board Schools, which are overweighted already, and where the teaching of general drawing is as much as can well be looked for, and would be far more in place. The section of Mechanical Science is to be presided over by Professor Vernon Harcourt, whose Presidential address will no doubt be worth attention. Light Railways and River Weirs will be among the subjects treated of in this section, both of which are of practical interest to the country in a broad sense. As usual, a good many excursions are arranged for, including Bury St. Edmund's, Colchester, Cambridge, Great Yarmouth, and Cromer.

A CONSIDERABLE space is devoted in the last number of *Construction Moderne* to an article by M. Planat in regard to a communication from the town of Nancy calling for the suppression of "Universal Exhibitions" in Paris, urging that the coming exhibition must, at all events, be the last; that the country is getting disgusted with them, and that the tendency of such exhibitions is to denaturalise Paris as a centre of intellectual and artistic life, and make it a mere show place. This argument is evidently regarded by some of the Parisians as worthy of serious attention. Another mischief, to which M. Planat alludes in his article, is the permanent alteration of many localities in Paris which have great historical interest, and which are deprived of this for the sake of a temporary exhibition; the exhibition buildings are cleared away in time, but the old Paris sites and streets which they have obliterated can never be replaced. We are not surprised at such a note of remonstrance being struck, but to our thinking the mischief lies mainly in having such exhibitions too often. At reasonable intervals of time they are beneficial and interesting; repeated too often they become a nuisance, and their character is lowered in the restless endeavour to render each exhibition more attractive (or shall we say more startling?) than its predecessor. The 1889 Paris Exhibition was certainly of great interest, but if there was any idea of having one in 1900, the 1889 one should not have been held; the two are far too close together. The 1900 exhibition is now a settled thing. After that, let us hope the French Government and the French people alike will have the good sense to see that such exhibitions are only valuable when they represent the collective work and progress of a generation. The world could very well do with a Paris Universal exhibition once in a quarter of a century; but that is enough, if the thing is to be really well done, and of the highest class.

THE questions which have recently been addressed in the House of Commons to the President of the Board of Trade in regard to the ventilation of the underground railways, may have some indirect effect on the two railway companies of London chiefly interested in the underground system. It is clear that the Board of Trade has no authority by means of which it can at present enforce good ventilation. It is by no means certain, however, that unless these companies endeavour to improve the present state of affairs, some legislation may not take place. The Board of Trade have now the power to see that the permanent way of a railway is in a fit condition before it is used. Most railways are used above ground; but where a railway runs underground, it would seem that the Board of Trade ought to have the power to insist on a wholesome system of ventilation. Good air is something more than a mere convenience to passengers; it is a necessity. The public are not asking for an impossibility, as was shown by Mr. Keith, C.E., in his letter to the *Times* last week. This gentleman recently reported on the ventilation of the House of Commons, and he says in the plainest language that "there is no reason in the world, even with the present steam-traction arrangement, why it should not be the best ventilated railway of its kind anywhere, viz., the coolest in summer and the warmest in winter, with the atmosphere invariably fresh." We hope that some among the many new, and we trust energetic, Members of Parliament, will not allow this matter to drop.

NO Minister could afford to make light of the important deputation on the subject of the East London water supply which waited on the President of the Local Government Board at the end of last week. The deputation asked that the Board should institute an official inquiry into the cause of the recent water famine, and Mr. Chaplin promised to give the matter a careful and candid consideration. It appears that the water company base their defence for the short supply, in the first place, on the drought. But, after all, this summer cannot be regarded as anything of so extraordinary a nature as to make this defence a sound one, for a water company should take dry summers into consideration, and be prepared to cope with difficulties. The second and third defences are insufficient storage, said to be caused, as regards the first, by the action of Parliament in 1893, and breakage of consumers' pipes. We can scarcely think the water company can substantiate this defence. But inquiry or no inquiry, this recent deficiency of the supply of water to the East End is a strong argument in favour of one central public authority, whose primary object shall be to supply the public as efficiently as possible, not to take care of the shareholders' pockets. Probably the real secret of this recent breakdown is the conflict between the interests of a body of private shareholders and those of the public. The continuance of the supply of water to London through the agency of limited companies, whose first object is the giving of dividends to shareholders rather than of pure and abundant water to householders, is an anomaly which must be ended.

THE recent questions in the House of Commons as to the sanitary condition of Aldershot have elicited very unsatisfactory information from the responsible officials. It is admitted that there have been a number of cases of diphtheria, and a very large number of sore throats. All that the officials can say as to these diseases is that it is thought that they have arisen from the opening of old drains for the purpose of alterations and improvements. It is obvious that if the opening of old drains is the cause of these attacks, that the state of the drains is a disgrace to the nation. But, in truth, one of the most striking anomalies of the present day is the fact that whilst the Local Government Board is doing very good work in obtaining better sanitation in private buildings, edifices which are under the control of Government departments are in a worse sanitary condition than ordinary private buildings. It is not long ago that it was admitted that the sanitary condition of the barracks at Windsor was very bad. Dublin has long been a by-word in military circles, and we make bold to say that an impartial inquiry would probably result in the condemnation of most of the barracks in England, from a sanitary point of view. We hope that this question will not be allowed to rest, and that the illnesses at Aldershot will be traced to their source.

WE understand that the arrangements made by Mr. Lionel Cust, the newly-appointed Director, for transferring our National Portrait Collection from Bethnal Green Museum to Trafalgar-square will shortly be completed. This collection, its nucleus being the Chandos portrait of Shakespeare, was first opened to the public in 1859, in a house in Great George-street, Westminster, having been established three years previously by the State, with a subsidy of 2,000*l.*, upon a resolution moved by Lord Stanhope. After about ten years the collection had so greatly increased that, pending the provision of more suitable quarters, it was transferred to some of the wooden galleries of the Exhibition buildings (1862) at South Kensington, overlooking the late Gardens of the Royal Horticultural Society. Those galleries were by no means adapted for the proper custody of so valuable a collection, whose safety was at length placed in jeopardy by a fire which broke out in an adjoining structure. So in 1885-6 the pictures, busts, autographs, and other exhibits were taken to the Museum buildings at Bethnal Green. For the new galleries Mr. Alexander munificently offered 60,000*l.*, a gift which he subsequently increased with a further sum of 20,000*l.*, in order to efficiently carry out Ewan Christian's designs, the Government voting 16,000*l.*, which, we believe, has been devoted to the connecting wing at the north-east end of the National Gallery. The contractors were Messrs. Shillitoe & Sons, of Bury St. Edmund's. For clearing the ground at the end of Charing Cross-road were pulled down Hemming's-row, formerly known as Dirty-lane, built in 1680, the old parish workhouse, and some houses at the south end of Castle-street. The London County Council conveyed to the Crown for 7,000*l.* a plot of land abutting on Hemming's-row, throwing 900 square feet into Charing Cross-road, the Crown, at the same time, agreeing to throw an area of 575 square feet of its own land into that thoroughfare (1889).

THE new memorial church to the late Emperor William, which was inaugurated on Sunday last, is from the designs of "Baurath" Schwaechten, and occupies a conspicuous position in the Grunewald-avenue to the west of Berlin. The site is an isolated one, and a number of important roads cross the avenue at the point where the new church has been erected, so that an open space had to be formed around the site to allow for the traffic. The site is now practically an irregular "square" of about 500 ft. in every direction. Herr Schwaechten obtained the commission after a competition, in which his plans had been premiated. The foundation stone was laid early in 1891, and the work has really only been in the hands of the builder for four years. The result is that, though officially "open," the new place of worship is far from complete, especially in the interior, and that several years must elapse before the workmen finally move out of the building. The design is based on the "Romanesque" churches of the Rhine, and the result is that the building is a somewhat clumsy pile, which would not find much favour in this country. In plan the design is only remarkable on account of the spacious porch, which serves as a memorial hall, and over which a high tower has been erected. This tower is about 350 ft. high, and is surmounted by a heavy Imperial crown. There is seating accommodation in the church for 2,000, and much money has been expended on the organ, the clock, and a fine peal of bells. The total expenditure will be 3,200,000 marks, or about 160,000*l.*

A REPORT to the Local Government Board by Mr. Evan Evans, on an outbreak of diphtheria at Holbeach, gives the conclusion that the illness was communicated from other places, and was not directly due to the insanitary state of Holbeach; but at the same time records a state of

things at Holbeach which must leave it a fertile field for the propagation of infection. It appears from the report that there is a great deal of overcrowding in Holbeach; that the sewage is run into dry wells which are not steined, and that except for a few water-closets in the better class residences, excrement is almost everywhere disposed of in privy vaults and privy pits sunk at varying depths, all which receptacles allow of leakage, while their contents are only emptied at long intervals. There is want of sufficient and suitable privy accommodation for many of the smaller cottages, and complaints were made as to nuisances arising from the percolation of excreta from privies immediately adjacent to washhouses, food-stores, and living-rooms. The water-supply is partly derived from rain-water collected off roofs, and stored in underground circular brick tanks, and partly from shallow wells, 6 to 12 ft. deep. The wells are merely dry-steined, and, from their proximity to cesspools and privies, but few are beyond the reach of contamination. All the public wells, with two exceptions, have been so much fouled by emanations from the gas-mains as to be unfit for household use, and for similar reason the supply of many private wells is compromised. Many cottages are without a water supply, and their inmates have to beg water of their neighbours. The Medical Officer of Health has repeatedly drawn the attention of the Authority to the polluted water-supply, and to the various nuisances prevalent in the district, but without effect. It is to be hoped that the Local Government Board will bring some pressure to bear on the so-called "Authority" which thus neglects its obvious duties.

IN the curriculum of the Architectural Association we notice some new and important features. In the first place, the Committee has recognised the existence of two distinct types of architectural students, the man who wishes to pass the Institute examinations and qualify for membership of the corporate body, and the man who intends to ignore the Institute and aim at the Academy and Fine Art. For both of these provision is now made. For the former by bringing the recent curriculum more into line with the Royal Institute of British Architects' examinations and definitely basing the instruction on the requirements of those examinations. For the latter by the revival of the former Classes of Design, on the voluntary system, which were one of the oldest and most successful of all the institutions of the Architectural Association. The examination course is now arranged so that a student may, if he so desires, attend all the lectures in preparation for either the Intermediate or the Final examination in one session. This will especially meet the needs of numerous young men who come up to London from the provinces for a time to complete their preparation for an examination. By coming to London at the beginning of October they can go through their course at the Architectural Association and sit for their examination in the following June or July fully prepared. Provision is also made for those who desire to spend a longer time over their preparation or to work through a studio course as well. The other class of student will work in the School of Design and Handicraft, uniting the study of design with the study of handicraft in various technical schools, so that he may comprehend the meaning of what he designs and the capabilities of the material in which he is working. His designs are then to be criticised by the Visitors, the list of whom includes some of the very best of our present-day architects.

TESTS OF FIREPROOF MATERIALS, NEW YORK.—A committee of architects, engineers and representatives of insurance companies in New York has arranged to make an extensive series of test of fireproofing materials, on a scale comparable with the conditions which exist in the case of fires in actual buildings. It is intended to try the effect of water as well as fire.

LETTER FROM PARIS.

IT appears that a serious difference has arisen between the Department of Fine Arts and the Municipality of Avignon. The latter, intensely ignorant, and seemingly manifesting the most absolute contempt for the archæological riches of this interesting town, has almost unanimously voted the demolition of the celebrated ramparts that form around the ancient Papal city a picturesque entourage so perfectly restored by Viollet-le-Duc. Naturally, this act of vandalism has excited an universal outcry, and the whole Parisian press has denounced with indignation the stupid decision of the Avignon burgesses, which, let us hope, will never be carried into execution. Indeed, for that the acquiescence of the Government would be required. For the ramparts of Avignon, just as much as the palace of the Popes, the arch at Orange, the theatre of Arles, or the citadel of Carcassone are carefully-preserved historic monuments with which an imbecile Municipality may not meddle. The Minister of Fine Arts will know how to save them, and they will remain, as heretofore, one of the curiosities of Provence.

Although we are here discussing a question *extra muros*, it is somewhat curious that we should have to point out the carelessness and ignorance of certain provincial Municipalities with respect to historic monuments which would have disappeared if the press of Paris, and the artists of the capital, had not taken up their defence and saved them from total destruction.

It is announced that the Mairie of the Xth Arrondissement, which has already been referred to in the *Builder*, will be ready for inauguration on February 24 next, under the auspices of M. Félix Faure, President of the Republic, who was born in that Arrondissement. We have already said that this Mairie, Renaissance in style, does great honour to its architect, M. Rouyer. It is situated in the Rue Faubourg St. Martin, and occupies an area of 2,200 superficial mètres. The cost of erection amounts to 2,200,000 franc. It is likewise announced that the monument to Emile Augier on the Place de l'Odéon will be immediately commenced. It will consist of a granite stele, adorned by two female figures, symbolising the principal works of the poet, and by a statue of a child personifying the genius of Comedy. Raised above will be the bust of Emile Augier. It is believed that this monument will be ready for unveiling at the end of the month of October. In the following month of November, the inauguration will take place of the monument, erected by subscription, to the memory of the military painter Charlet. This monument, the work of the sculptor Alexandre Charpentier, will be erected in the centre of the square of the Place Denfert Rochereau. It will consist of a stele bearing, on a medallion, the effigy of the painter. At the foot of the monument, two figures will recall two types often represented by Charlet, a Grenadier of the Imperial Guard and a "Gamin de Paris."

We may mention, in this connexion, that a Committee has just been formed to erect in Paris a monument to the memory of the poets André Chenier and Roucher, both of whom died on the scaffold in 1793, victims of the Reign of Terror.

The avenue called "des Reines," which surrounds, in the form of a semi-circle, the garden of the Luxembourg will be shortly completed by the statue of Margaret of Anjou, the work of the sculptor Taluet, which will occupy the place left vacant by the "Velleda" of Maindron, which it has been thought well to place in the new square of the Tuileries. This Velleda, which formerly adorned the ancient *pépinière* of the Luxembourg, had acquired a reputation entirely fictitious, for it is a figure with little decorative value, utterly banal and defective in execution. The State, which purchases every year numerous works from the sculpture galleries, might without any regret have left the Velleda in the store-house and found a more modern statue for the decoration of a garden which contains such remarkable works as the "Quand-même" of M. Mercié, and the "Exiles" of M. Mathurin Moreau, a photograph of which has already been published in the *Builder*.

It appears that the French Government intends asking from the Belgian Government for the removal to Paris of the remains of the celebrated painter Louis David, who died an exile in 1829, and was buried at Brussels. Pending this solemnity, the Minister of Fine Arts has instructed M. Emile Soldi to execute a marble bust of David, which will find a place in the galleries of the Palace of the Institute.

Strenuous endeavours are being made at the Palais des Beaux-Arts, in the Champ de Mars, to organise the International Exhibition of the centenary of lithography. This exhibition, which will open its doors on September 19 next, is already said to be most interesting. It will comprise a retrospective section and a modern section. Moreover, the public will be able to see at work, in the Avenue Rapp, the machinery employed in commercial lithography and the printing of the large coloured posters, which, thanks to the painters Chéret and Hugo d'Alesi, have, during recent years, made so great progress. The committee of this forthcoming exhibition has for honorary presidents MM. Puvis de Chavannes and Detaille. MM. George Duplessis and Benjamin Constant, Members of the Institute, preside over the two sub-committees entrusted with the reception and classification of ancient and modern examples.

We are pleased to announce that the Museum of the Louvre continues to increase each year, thanks to the intelligent energy of M. Kaempfen. Thus it is that the galleries of modern French sculpture, which are situated in the north-west angle of the square court, are about to be enlarged by the addition of two rooms intended to contain, amongst other acquisitions, the casts presented to the State by the widow of the sculptor Carpeaux. Likewise in the ancient *Salle du Manège*, situated under the grand gallery of French paintings of the seventeenth century, is about to be installed the collection of casts and reproductions of celebrated works in foreign museums. It is hoped that it may be possible to open these new rooms to the public at the beginning of next spring.

On the left bank of the Seine, between the Champ de Mars and the esplanade of the Tuileries, work is actively proceeding with the future line called "des Invalides," which will ultimately be extended to Cluny. As soon as the Esplanade Station is completed, the State will proceed with the Montparnasse Station, which has become notoriously inadequate, and will transform it into a veritable modern station, with direct access to the Boulevard Montparnasse by grand staircases, which will connect the departure and arrival platforms with a great waiting-hall, communicating directly with the Place de Rennes. Thus transformed, the Gare de l'Ouest on the left bank will become one of the terminal points of the State lines, which comprise an extension of about 2,000 kilomètres, and this latter will become, on the completion of the works, the property of the suburb of Versailles on the left bank. All these important works, proceeding concurrently with those at the Gare du Nord and the Gare de Paris, Lyon, Méditerranée, will be completely finished for the Exhibition of 1900.

At the École des Beaux-Arts, where the death of M. Ancelet has caused a vacancy in the Chair of the Professor of Ornamental Design, several competitions have just been decided. In the competition in construction second class medals have been awarded only to MM. Frouscat and Brune, pupils of MM. Moyaux and Pascal. In the competition of the second architectural class, of ninety-four designs submitted, the jury has reported that honourable mention of the first-class has been obtained by MM. Leenhardt, Vasnier, and Hormbastel. Lastly, in the competition for detail, for which the subject was a "Loggia," the jury has awarded only second class honourable mention to twenty-nine competitors, which is not a result worthy of praise.

On Friday last week there was buried in the cemetery of Pecq (Seine-et-Oise) the architect Varcollier, who died at Paris on August 27 after a long and distressing illness. Marcellin Varcollier, son of a former official of the Préfecture de la Seine, was sixty-six years of age. Formerly a pupil of the École des Beaux-Arts, he was honorary architect of the town of Paris and member of its architectural council. Amongst his principal works we may mention the synagogue in the Rue des Tournelles, erected about eighteen years ago, and amongst later works, the new Mairie of the XVIIIth Arrondissement, opened about three years ago. M. Varcollier leaves several children, and one of his sons, a rising young architect, is connected, under the direction of M. Bouvard, with the works of the future Universal Exhibition.

The death is also announced of M. Jean Garnier, a talented sculptor in metal. One of his works, "L'Enfer des Luxurieux" of Dante, is in the Museum of the Luxembourg. This clever artist, who gathered successful inspiration from the Renaissance Masters, made the grave mistake at one time of abandoning art for politics, and during the sad days of the Commune he was appointed Keeper of the Dies at the Mint, under the direction of "Citizen Camélinat."

DOMESTIC METAL-WORK.*

By HARRY SIRR.

I AM hardly surprised that in the abundance of intense enthusiasm displayed in study and research which led to and had for its full result the culmination of that remarkable Renaissance of modern times—the Gothic revival—much of the work of our more immediate ancestors which had largely enhanced their domestic surroundings was lost sight of. I now more particularly call to mind such metal accessories as furniture, either applied—as in the case of door-locks and escutcheons—or portable utensils, such as candlesticks and fireplace adjuncts. In England alone there is quite a wealth of such remaining, and it is to the study of these I would particularly direct some attention.

It is undeniable that to a very great extent the value of a good architectural interior may be lessened by meagre and worthless furnishing; while, on the other hand, with due care a mediocre dwelling can be rendered interesting and yet unpretentious by the introduction of simply-designed and well-made essentials, whether they be fixtures, fittings, or furniture, and of whatever material they are made; for there is no reason why the consideration of convenience, which is of paramount importance, should be incompatible with rendering objects of daily use pleasing in appearance. This is why I think it may be interesting to you if I touch upon some such things which have claimed my attention. Perhaps they may not all of them be such as invariably succeed in claiming the interest of architects, and they certainly receive but a poor share of it from the general public; but the majority of the latter are not interested observers, nor are they educated judges, as we know by experience. Take them for example in the selection of grates. How frequently a client sustains a perverse preference for the vulgar and ill-designed goods offered by some ultra-commercial house! I reflect at times upon the happy results which are always possible in the choice of such articles by the display of good taste, but I am well aware of difficulties which would at once crop up if I attempted to define salient essentials to its manifestation. I will but venture to hazard the remark that to a great extent I believe good taste is really inherent, although susceptible to regulation and improvement, while it can also be largely acquired by acquaintance and familiarity with acknowledged good art, and with this fortunate result, that sometimes, at any rate, an individual is thus led to seek good expert advice, and to be guided thereby.

I cannot in this paper do more than glance as it were at small patches of the vast field which the subject covers, and it would be difficult, therefore, to attempt the consideration of any of the objects I may refer to in chronological order—indeed, it would be exceedingly laborious to forge a catena of evidence sufficiently strong, and I think no end would be served, so far as we are concerned this evening. In most work some characteristic stamps the date with fair accuracy, and it is certainly satisfactory to be able to note this, but an over-abundance of archæological zeal while dealing with the design and workmanship will hardly benefit us, although we must all feel the additional interest in works which are old—the relics of our forefathers, and especially when of historical importance.

In her "Essay upon Needlework" the Countess of Wilton has said—"From the stateliest denizen of the proudest palace to the humblest dweller in the poorest cottage, all more or less ply the needle, and need its practical services." How true this is! And yet not one whit less is the range or scope of the practical services rendered by the metal-worker.

Our ethnological studies soon show the intimate connexion of metal-work with the history of man, and tradition and relics attest to the Ancients' appreciation of it. When we get to modern times comment is unnecessary. I exempt work in precious metals because the goldsmiths' and silversmiths' art are quite separate subjects. I am now concerned only to strongly maintain that the fashioning for domestic purposes of the metallic elements iron, copper, and lead, and the compound bodies of steel and brass, are works which in this day—quite apart from their conversion for engineering uses—still claim and deserve æsthetic consideration and handling on the part of the designer and craftsman. At a time when real civilisation and progress are not to be associated with warfare, when we have abandoned great embellishment on our weapons and firearms, we cannot afford to forget the domestic life of our nation which *must* receive attention. The advance of education, the better knowledge of sanitary laws, and increased freedom, are not likely to fail in promoting the comfort of the community at large; but it is highly doubtful whether their education will in general lead the majority to supplement their appreciation of beautiful surroundings in nature, with a ready discernment and perception of that which is vulgar and tawdry in human handicrafts, unless the refining influence of art is brought to bear upon them in things large and small: and, if it is desirable they should become educated in this respect—for it is an important part of culture—it is necessary that their houses and home surroundings should be well designed in addition to being rendered wholesome. How one yearns for the time when the public will *demand* houses which manifest refinement!

It is now, when he is being encouraged in so many ways, that we must do our part to restore the lost prestige of the workman or craftsman, not only by impressing him with the fact of the giant share which he has in the Arts of Peace, but by persistently specifying well-designed and well-made goods, and thus create an increasing demand for such, which will give encouragement and help to all concerned in their production. In a truly utilitarian age, when people seem to become altogether callous of beauty in an absorption in mechanism and machinery, if we can do this much, who can say but that in the future we may largely aid to reclaim our manufactured goods from the ugliness, vulgarity, and senseless ornamentation which characterises so many of them? I quite well see there are improvements going on, but I do not believe in stopping short in our crusade, even for the space of a moment. The mere contemplation of it all is a pastime only—soothing, no doubt, but our good intentions should be manifested by the carrying out of such real work for the cause as is within our reach.

And now I will ask you to bear with me while I take a rather long jump down the Ages, and glance at some of the productions of ancient times to see what we find to admire in the shape of metal-work of a domestic character. I cannot, of course, refer to the ancient times without mentioning those beautiful objects, the Greek and Roman lamps. Lamps were common enough in Rome—Pliny refers to them; and hundreds were exhumed from the buried Vesuvian cities. Many are dolphin-like in form, some have their ends worked up into the form of a shell, and others are embellished with animal forms. I call to mind a specimen in the British Museum ornamented with lions' heads and satyric masks. The usual support was an independent candelabra. Much ingenuity was exercised by both Greeks and Romans in the construction and ornamentation of these supports, which combine lightness and elegance. The shafts are ornamented with twining ivy and the graceful acanthus, or they have perfectly plain stems—sometimes fluted; and frequently the stems represent the throwing out of buds, or they are in the likeness of a reed or cane. What is noteworthy is the general striking resemblance of all the examples, while the details of the ornaments are of infinite variety, and the profusion of the latter is remarkable in the elaborate examples. This kind of support was either surmounted by a socket to receive a wax candle, or a disc for a lamp to stand upon. The base was generally a low tripod of lions' feet or griffins' claws.

Those which are found at Pompeii or Herculaneum are not only remarkable for the beauty of workmanship, but also on account of the whimsical variety of their designs. There is an instance of one which is of very ingenious construction, so made that it can be taken to pieces for convenience of transport.

I call to mind, also, an Etruscan tripod candelabrum which is in the British Museum, of much beauty and fine workmanship, supporting a figure as a stem with a socket on the head. In passing I may mention the curious disc-like members round the stems of some ancient candelabra, like pippins strung on—the very reverse of the characteristic saucer treatment of Italian ones in brass which were copied by the Dutch.

This ancient work is in bronze of fine quality, and so renowned were the Etruscans for their works of bronze that they spread over the whole land and sea.

Then again, in the British Museum, there is an especially fine tripod from Herculaneum, and another which is ornamented with panthers' heads. I must also call attention to the fine bisellium and lantern, the former bequeathed to the nation by Sir Wm. Hamilton and the latter by Sir Wm. Temple; and to the many beautiful inscribed tablets, and the keys, which, in the antique, are often elaborate with ornate bows. There is even a padlock from Pompeii, somewhat like a snail in shape, and so one could continue calling to mind objects which illustrate the Ancients' great skill and exquisite taste. Most of these objects are, no doubt, from rich houses, many are from public buildings, but there is sufficient evidence in the simpler things to convince us of the care bestowed by them upon ordinary work.

I have gathered from what I have read of Pompeii that, as a rule, their doors turned on pivots, and they were secured by one or two large bolts. When hinges were used they do not appear to have been ornamental, but some of the external door-handles are very handsomely wrought. Although these people excelled in their ornamental work, the locksmiths do not appear to have been remarkably dexterous.

I have referred to the prevailing use of bronze among the Ancients, but it was discovered in Pompeii that iron and lead also had been employed for the same purposes for which we now use them, and, contrary to what has been found to have been the practice among all other ancients, iron, and *not* bronze, was the metal most freely employed.

It is astonishing that we so seldom use bronze now when opportunities arise, for it is wonderfully enduring, can be cast and chased with the finest finish, and takes gilding as well if not better than any other metal. I know of one instance only which has come under my notice of its employment by an architect latterly, and in this case some ornamental gate panels, and brackets for marble shelves were cast in this metal and chased.

I feel it is important to study the ancient metal-work, and I never tire of recommending a careful examination of the examples we happily possess. There are no other works so well worthy to serve as models in regard to their beautiful proportions, perfection of elegant design, and exquisite delicacy of workmanship.

It is true some of them are elaborate, but so much is gathered in and learnt by knowing them that it becomes easier and easier to discern and appreciate good work, and to discriminate with a true critical judgment; and this is of the highest importance to an architect.

When we come to deal with our own country, if we start with the Conquest, articles of furniture were coarse and few. Iron then came from the shores of the Baltic, but its use was principally for agricultural purposes, and little was imported beyond the bare necessaries of life. From 1200 to 1500, when important changes were taking place in the condition of the people, there were the great fairs. Flemish merchants no doubt besides cloths brought metal, and the traders of the Hanse Towns iron and copper for farmers. Bruges and Antwerp sent household furniture, metallic and other necessaries of all sorts; and the annual visits of the Venetian fleet must have been a great stimulus to the acquisition of useful and decorative articles. And so up to the fifteenth century, when our large mineral wealth of iron was hardly touched, and England supplied nearly all Western Europe with tin and lead. But with this growing interchange, and travel of our merchants abroad, we began to think about and to seek greater and more advanced comforts in our houses, and although many articles we now look upon as necessaries were then really luxuries, and it was consequently only in the power of the great and wealthy to acquire them, yet gradually a vast change took place, till, in the Elizabethan era, and from then onwards, we developed rapidly in the matter of our domestic comforts. As an example of this, up to the Middle Ages the use of candles had been chiefly confined to churches, monasteries, and the houses of the nobility; but in the fifteenth century their use became very general, and at that time the trade of making them had assumed so much importance that the chandlers of London acquired an Act of Incorporation, and from this we can see that candlesticks had become necessary.

It is therefore quite understandable how it should have transpired that during the Gothic (chiefly an ecclesiastical) revival, little was or could be done in gaining much from the domestic work of the Middle Ages in England. The Mediæval iron locks, hinges, &c., had become superseded except for churches and buildings which partook generally of an ecclesiastical character, and the finest old examples we have are chiefly met with in churches and large buildings. At all events the metal-work of our

* A Paper read before the Discussion Section of the Architectural Association.

immediate ancestors was overlooked for a time, and there was a huge gap with little or no progress in design—domestic metal-work suffering not the least from this neglect—indeed, its character commenced to deteriorate.

Brass had been made in Germany for many centuries, but its manufacture was not introduced into England till 1649, and from another authority I find no commercial brass was here till 1721 (as the metal termed "Latten" was very differently made). I cannot account for the disparity in dates. But for our purpose either is sufficiently significant. Brass goods, I presume, were made in England before, but no doubt the manufacture of brass in our country led to a greatly increased demand for goods in that compound metal. It appears pretty evident there was no domestic brass for the revival architects to study.

Pray do not suppose that I plead for elaborate and consequently comparatively expensive work in humble dwellings. This is not my view, for not only would it be out of place, but it would be altogether injudicious for an architect to saddle his client with an excessive outlay on the metal-work, just as much as it would on work of any other description. What I do plead for is simplicity itself, and yet with cast work the first cost is so little that I certainly think at times some legitimate ornamentation should be obtained, and at all times pleasing appearance in line and contour.

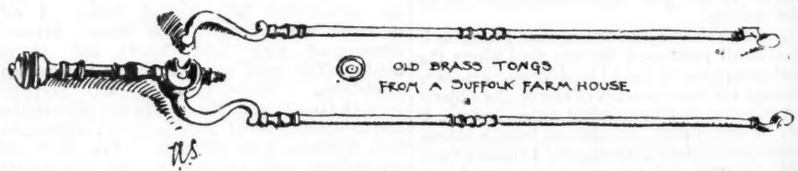
The register grates are now becoming antiquated, but I refer to them because the kind of ornamentation generally found upon them well illustrates the sort of meaningless work which was turned out plentifully some years ago. Who were the designers then? Can it be that the demand for these goods was so great, and the hurry so tremendous, that the qualifications of designers were never once inquired into? or were capable designers purposely ignored? Again, take cast-iron fenders, and look at some of the grotesques at ornamention! I cannot think where the ideas originated. Some of the cheap fenders of the present day, made up of steel hollow bars and cast-iron, are perfectly wretched in design, and the ornament is utterly bad. I recently came across a really good cast-iron fender front. It was not pierced at all, and therefore from the point of view of comfort, it might be regarded as a retarder of radiation, but as regards its treatment—for a simple piece of cast-iron it was perfect. As I remarked, it was merely a front, curved on plan. The decoration consisted of a groundwork of reedings or flutings in diagonal directions from a lozenge centre, upon which there was a small sprig in relief, and the extremities were treated with a groundwork of vertical close beadings. The top and bottom were emphasised with a few small shallow mouldings, generally beads, with a plain surface between them and the groundworks. All this is appropriate, simple, and effective, for when such work is dressed as intended, with black lead and polished, the effect due to the play of light upon it is extremely pleasing. I have frequently observed the effect of similar work ruined by the thickness and dulness of the japanning coat which has been applied, a great saving of labour I freely admit—so was Nubian blacking for boot leather, which fascinated the town one winter, but people found *that* out and gave it the cold shoulder.

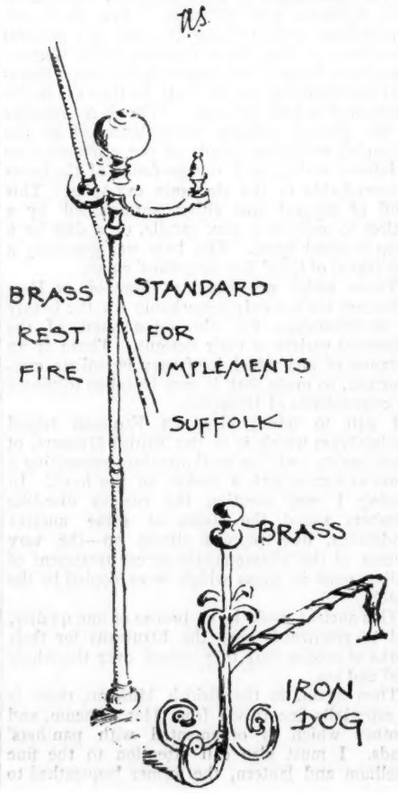
I think I am not wide of the mark if I say that without doubt the best goods of this kind we find are generally the simplest, and the most free from redundant and undecorative ornament.

I will now ask you to further bear with me while I refer to some good work which has been done in the way of grates. Some of the best that we have come to us from the times of Queen Anne and her immediate successors. In many of these we meet with little wrought-iron columns as standards, finished with terminals, often of brass, vase-shaped, with curved or serpentine-shaped brass or steel face-pieces or frets below the bars. At times we find the bars of steel, with fret and standards of brass, and at other times the pierced fret is curved forward in a dipteral manner towards detached standards, as in eighteenth-century examples. How decorative the treatment is! and yet I know we cannot now do the same with Teales' grates, and I am aware that we have many good modern designs; but for all that, there is still much to be learnt from the study of these old grates in the way of the treatment of metal, and the fine effect obtained by silhouette. Adams devoted some of his attention to hob-grates, and his designs are very fine; and even nowadays there are rooms in which we can tolerate them, although not strictly orthodox in regard to the height of the fire-grate above the hearth, and notwithstanding the fact that they are often delivered over to the mercy of the "house-wrecker."

We have plenty of examples of old fenders, and the brass ones seem to be favourites at the present time. They illustrate admirably the beauties of pierced work, either with or without embossing and the value of silhouette. Some of them give a healthy lesson when they exhibit their weakness by buckling, due to a lack of lateral stiffness under the pressure of feet. Although it is not good treatment to put feet upon a fender, undoubtedly it should be stiff and free of liability to buckle. These old fenders are often too high for modern ideas. I speak as I find. Their design, however, is generally admirable, and much is to be learnt from them.

Brass Tongs, Bruges.





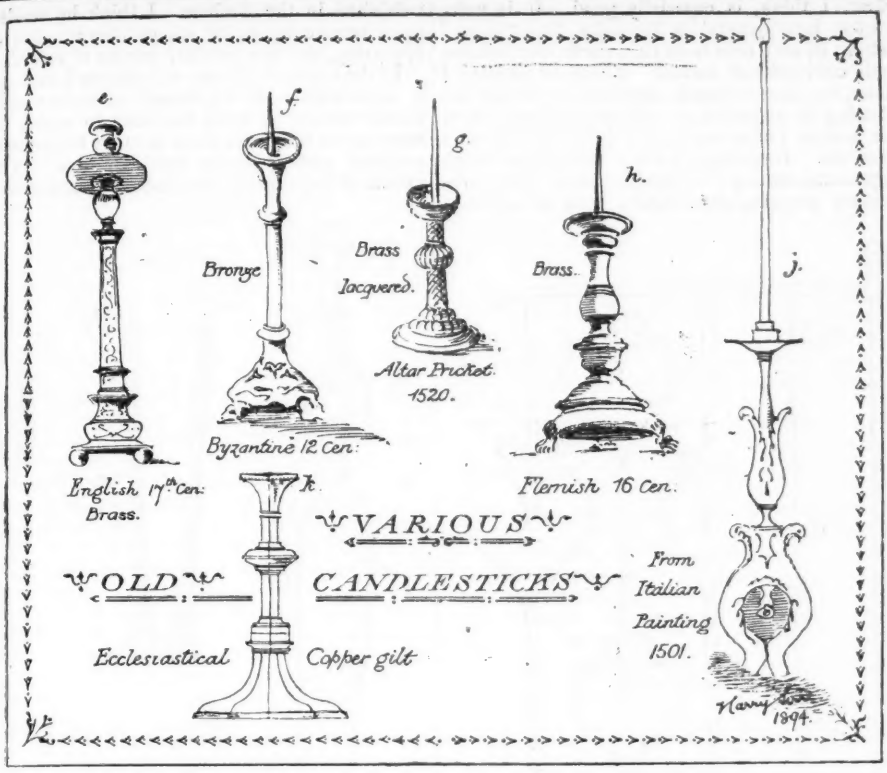
In old brass fire implements we get delightful and elegant shaping, and the moulded work of the handles, and of the knobs upon them, and the old fire-rests is perfect. Again, I must make myself quite clear. I am not desirous that people should be burdened with brasswork to keep clean. That rests with themselves. I believe with brass fire-implements the trouble is really not so great. A periodical general clean and a rub with leather at intervals are quite sufficient. Steel implements should be kept bright, and yet often people who keep their steel very badly in this respect complain of the trouble of brasswork. The satiny polish which brasswork gets is due to the rubbing, with the further result that the work seems to improve with age; and this is why I am disinclined to favour the wholesale lacquering which is now so prevalent, concealing, too, as it often does, bad metal. I wish I could enter into the subject of the steelwork, but I do not feel able to do so this evening.

I am not aware that in our museums in England there have been yet collected to any great extent examples of domestic metal-work. Lady Neville's Loan Collection at the South Kensington Museum is extremely interesting, and shows what might be done by trustees and authorities. There are some other examples, belonging to the nation, at South Kensington, but they are chiefly Flemish. It is a very great pity that our own work is so poorly represented.

There are some fine specimens in the local museum at Bruges of all kinds of brass fittings, fireplace adjuncts, and domestic utensils; and also in the Plantin and Stein Museums at Antwerp. At Bruges, too, there are some good specimens of old shutter and other hinges and latches in tinned iron, and some choice door furniture.

In the South Kensington Museum we have a valuable collection of locks. There are some old brass saucepans in the British Museum—one with the handle inscribed "Loyal to his Majeste," another with the couplet "Pitty the Pore, 1684." This brings me to the subject of proverbs or mottoes. I cannot see any reason for entirely dropping their introduction on our domestic utensils. Our bread trenchers are a survival of this custom of inscribing, and we find a revival of it on some of the Aller Vale ware. Two hundred years ago a saucepan came in for its share, and certainly some wholesome advice could be given to cooks by this means; whether it would impress them is a question. The grate or chimney-piece of an English family sitting-room is a most appropriate place for a good motto, and if lettering be only studied, it will look pleasing on a perfectly plain surface. The old iron fire-plates abounded in this sort of decoration, as well as in emblems or arms, scriptural and allegorical subjects, and dates. As they should be applicable to our particular homes, temperaments, circumstances, or surroundings, perhaps it would be indiscreet to urge the introduction of mottoes strongly, as I should hardly like the enterprising manufacturers of cast-iron fenders to get hold of the notion and foist their own ideas upon us.

Let us now for a little while briefly consider some ordinary pieces of old-fashioned metal-work known to us all. I refer to candlesticks. Many people now give the light of candles the preference, and standard candlesticks are therefore still a necessity. We may assume that it has always been found satisfactory to make them at least in pairs—the common arrangement of a pair upon a writing-table is a homely illustration of the convenience of that. Within the recollection of many living people candlesticks (especially those of brass) used to be reckoned among the ordinary household effects. When lamps gained the ascendancy and subsequently gas was introduced, the candle being superseded, candlesticks went out of general use. In the country, especially in parts remote from towns, changes were not so drastic, and they were never entirely discarded. But in towns they made way for ornaments (so called) of meagre art, such as wax flowers, which then commenced to have sway. Now we have experienced a reaction, and the old candlesticks are sought after partly because it is difficult to get well-designed modern examples. I speak of England, and exempt silver candlesticks.



In olden times many materials were employed in their manufacture, but in general some metal was used, and one can hardly fail to mark the preponderation of brass, the others being principally pewter and bronze, copper also, and copper gilt, or plated. Unquestionably, however, brass is the most common of all the materials employed. This may be accounted for because it was comparatively cheap, and it may have proved more enduring than pewter, its nearest rival in this respect. The brass of which candlesticks are made varies considerably in colour, from a pale yellow to the warmer reddish hue, specimens of which are highly valued. When the colour is reddish, the metal approximates the nature of either bell-metal or gun-metal. As regards those of brass, turning entered largely into the process of making. This is referred to by Shakespeare in Henry IV., for he makes Hotspur vigorously assert his prosaic nature, and show his contempt for Glendower's boasted attainment in these words:—"I had rather hear a brazen canstick turned . . . and that would set my teeth nothing on edge, nothing so much as mincing poetry." They were turned in pieces which were screwed and brazed together, or later, a turned portion was so attached to the remaining portion (as, for example, the base), which had been cast to the required form.

The designs, which are slightly sketched and illustrated, are uncommon.

The varieties in shape seem to have increased and multiplied very agreeably, but the same essential parts are always present: these are —a spreading base supporting a stem, which is surmounted by a nozzle or socket to receive the candle. I may observe that in earlier candlesticks we find shapes which are not met with after the Middle Ages; examples of such are in the South Kensington and British Museums. But after those times the "column" and the "baluster" form are common, in the detail of which there is a charming and endless variety. If, for instance, we consider the column form, we shall find the stem either square or cylindrical, of equal diameter throughout, or diminishing towards the neck; or, if we study the baluster form, the shaped cylindrical stem will be found in some examples to taper upwards, or in others downwards. The spreading base may be either circular, oval, triangular, square, or oblong; or it may be a variety of one of the two latter, with rounded corners. The cap at the top is hollowed as a socket to receive the candle, but sometimes it is surmounted by a nozzle in the shape of a cylindrical moulded cup — occasionally vase-shaped. These instance only a few of the diversities in design. Domestic candlesticks, certainly of later times, invariably have a socket or nozzle, the "prickets" being used solely for ecclesiastical purposes.

Many bad examples are to be met with, and are collected when they are not worthy of house-room as regards their design. But yet in England we have a wealth of really good shapes. Although I do not admire some of the old-fashioned clumsier forms—made, I suspect, pretty near our own times—I infinitely prefer them to some of the fussy frail little lacquered things of modern manufacture, which only weigh a few pence. I think I have observed in manufactured ones of late a little sign of a return to old patterns. I wish those who produce or design would study the shapes and mouldings of good old examples, although I far from advocate the wholesale copying of them. How admirably some of these old examples are contoured or moulded with delicate curves, and slight projections and beads! A few simple lines and markings tell with fine effect; the projections, too, are just sufficient to catch the light, and rounded off to soften the shadows. There is an absence of crude, thick fillets, which so absolutely destroy the appearance of any good shape. What I feel is, our ancestors mastered their work well, and who will not agree with me that we, who are in possession of their productions to aid us, should strenuously strive to avoid the reproach that we, in any way, fall short of them? It is a strong conviction of this which induces me to attach some importance to an occasional examination of such common objects as old brass candlesticks, although we, as architects, are not directly concerned with their production. Nor do I claim that architects should devote their energies to the designing of such articles, except under special circumstances, for many are not fully equipped, perchance, to successfully design in metal. I keenly desire to arouse such interest in the subject as will lead to the seeking out of well-designed and executed metal-work, whatever its nature, so that a real demand for choice things may be felt. No doubt the cheap firms who so readily reproduce meaningless designs will to some extent be patronised by persons without the advantage of some art culture or of a good architect's supervision and advice, and by speculative builders, but depend upon it in the long-run this can be minimised. Good manufacturers are, I believe, naturally careful of their prestige, and there will be less to commend their goods when it is found that architects cease to admit into their buildings such as they can control the introduction of.

I am convinced it is a right step to take. We are in some measure answerable for prevailing taste. When one comes to reflect and consider what this excessive use in our day of poor and weak productions means for future generations, it ought to rouse us to make special efforts whenever we have the chance of specifying or selecting goods. Who can so far stretch his imagination to suppose that examples of our ordinary door-knockers of the last thirty years, for example, will be eagerly sought after in years to come? I have recently seen the following words of Sir John Vanbrugh quoted:—"There is perhaps no one thing which the most Polite part of mankind have more universally agreed in than the value they have ever set upon the remains of distant Times. Nor among the several kinds of those Antiquitys are there any so much regarded as those of Buildings." There is great truth in this, and we cannot fail to lament if we suppose our age will hand down to the future discreditable examples of any work intimately connected with buildings.

There is much contemporary work upon which no pains have been spared, for which we are very thankful, but I more especially refer to ordinary work. One has only to take a stroll around an old city like Canterbury to observe the care and ability which were once generally exercised in the production of such features as knockers for the humblest of dwelling-houses. I do not want to appear vehement, but after these little reminiscences it is difficult to restrain one's feelings when handling some of the trade lists and catalogues. I would not be unjust, but I think it righteous to try and create a demand for that which is essentially good. Shoddy would never hold sway if there were no demand for it, and I am quite sure simple, well-made articles can be produced in the long run, quite as cheaply as the incongruous trying-to-be-something-different-to-what-we-are kind of things which are so often offered for sale, at *low* prices it is true, when, however, they are dear at any price. And all this goes on, notwithstanding the new spirit which has been put into work, not only by able designers, but also by the men who are called upon to execute it. It is very distressing to deplore the lack of a due appreciation of the better work, and the consequent paucity of encouragement to all concerned.

I cannot go to the length of dwelling long upon any special objects, for my time is limited. If I were to touch upon knockers alone it would make a lengthy subject, and we should run the risk of becoming too archæological for our purpose. The majority of the Mediæval ones are rather stiff-looking. In Renaissance times they became very elaborate, and very special attention was paid to their design—in fact, at times, they are overdone. I really think some of the nicest simple examples are found on ordinary houses—even small houses—of the last century, merely in cast-iron. Many of the old brass ones have been blacked over, but, as a rule, this black can be removed, and the knocker cleaned and polished up quite bright again.

What a wealth of design there is in the old door-furniture! I more particularly now refer to that on external doors which is readily seen. Look at the variety of forms in the examples I have sketched, chiefly in Bruges. Brussels, Antwerp, and Malines are quite as well off in this respect, and I recollect some beautiful lock escutcheons in Lucerne. I am sorry I cannot call to mind similar work in the old dead cities of the Zuider Zee, but I fancy there would be some good simple examples in most of them. With plates for escutcheons, locks, ring-handles, latches, &c., certainly the earliest and easiest method of rendering them ornamental by stamping them into shaped outlines survived until quite late times, when scarcely any shaping has been attempted. In much of the elaborate shaping in old examples, of both iron and brass, the screws or nail-heads were never lost sight of. The shaped piercings are generally extremely pleasing, and there is an absence of any strained effort to combine square or angular forms with their flowing lines, which are so well accommodated to the curvatures of the main outlines. Then there are forms in which moulding enters; such, for instance are some of the eighteenth-century circular or oval knocker discs, which in brass look so rich and effective, the centre generally large and convex, catching the light like a great eye. Again, there is a more elaborate treatment, as in the case of a lock-case in which a stamped perforated plate is mounted upon a plain one, and the front so made has colonettes applied to its face on either side, with terminals and pendants and tying-in mouldings.

Occasionally we come across old brass plates which are engraved or chased, and then we get

all the charm due to direct handwork. What a variety in this kind of work is found on old cabinet-work from Jacobean times down to Hipplewhite and his times!—work in which we get shaping, stamping, chasing, moulding, and embellishment with foliage and flowers in relief. Let me draw your attention to a little sketch of a cast brass escutcheon (on an old spice-cupboard), with the supporters of the Royal arms, and a shield and crown in relief.

I cannot refrain from touching upon the subject of railings, although they are more or less structural. Few will defend the use of a railing in positions where it serves no real purpose, such, for instance, as the ridge of a building. When legitimately used, it can be kept perfectly simple, with good effect; or if funds admit it can be made highly decorative. And yet to what a deplorable extent this has been lost sight of in the miles of ill-designed modern railings in the suburbs.

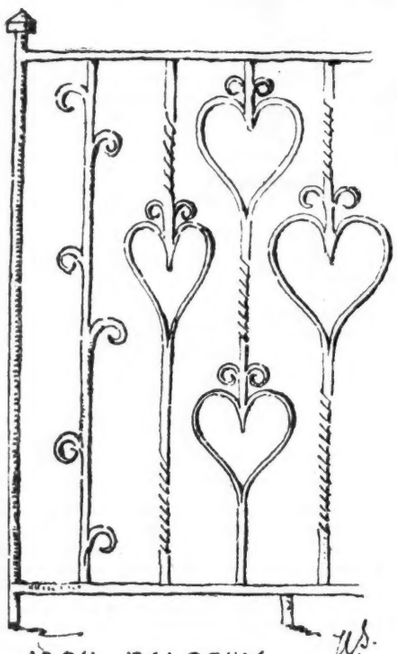
One seems naturally to prefer wrought-iron, because it so readily lends itself to giving variety and interest to the work; and the additional merit of lightness (which should be maintained, because it is a characteristic of wrought-work) renders it exceedingly appropriate as a boundary or a screen where the object is not also that of obscuring the view. When, however, it is essential to have cast-iron railings it is a great pity that simplicity is not more often studied. If a railing be simple the standards require symmetrical or equal spacing. When a special pattern is intended to apply to several varying lengths, such as frontages in town houses, difficulties crop up which have to be met. Now if an architect likes to leave the matter in the hands of the founder he may do so; but the founder's fitter does not always realise the importance of accuracy in adapting (which invariably means no little degree of scheming), for a few inches too many or too few are sufficient to cause real difficulties. And these difficulties occur if the curbs are not set out first, and their lengths so determined by a little adjustment as to be multiples of the spacing of the standards or the pattern. This must be considered by someone, and there is no shirking it if satisfactory results are desired. If wrought horizontal bars are used, especially holed, and every standard let into the curb, the spacing can be made to accommodate any difference in varying frontages. Any architect who takes trouble would of course arrange all this, especially if he had previously met with any difficulty; but it is quite obvious in looking around London that sad bungles of recent date are allowed to remain.

Referring to wrought-iron, fine old examples of railings and gates abound in the old suburbs of London. There are some in Highgate, for instance, and it is no easy matter to try and improve upon the simple and effective way in which the ends of the standards are treated. The extent to which the characteristic treatment by tortion is manifested, shows how well our ancestors could keep it within bounds.

I give an illustration of part of an iron balcony front from Bruges.

At Berne, in Switzerland, some of the pavements are a considerable height above the roadway, and so open railings are put to protect foot-passengers and to support the handrails to the flights of steps. There is a quiet lesson to be learnt from the treatment of these. They are quite simple, the standards are well proportioned, with here and there a little brass terminal to enhance the appearance and emphasise the angles, and altogether there is quite a charm about them which an architect would hardly fail to appreciate.

I have here among some specimens of old brass-work a warming-pan. It may not be thought a very beautiful object, but my reason for showing it is to call attention to the simple ornamentation by means of piercings and some odd chased work, which looks as though it had been done with a wheel run about. I consider it quaint, and a legitimate way of decorating the polished brass face. I also show an old Flemish petroleum can, which in shape cannot be said to rival some antique bronze vessels, but it is sturdy and looks suitable. The English copper coal-scuttle derives much value from the colour of the metal, but it is also very beautifully shaped. I will not claim that it is so easy to scoop from as one which is flatter in the bottom; much, however, depends upon the shape of scoop. But it probably was meant for fair-sized knobs of coal (and not dust), which would be lifted out with tongs. The little Flemish cast openwork teapot-stand is a pleasing piece of work, and the old wall spill-box, in brass, is interesting, with its slightly chased simple border. The old English "footman" or trivet, I think, is especially good. It is noteworthy how general a favourite the "harp" pattern is, and here is an example in combination with conventional leaves. These oddments, I claim, do show rational treatment, and they are pleasing in appearance. Of such things, there are several foreigners in the South Kensington Museum. To instance a few: there are a Dutch eighteenth-century birdcage; a pair of eighteenth-century sconces, also Dutch, with an effective



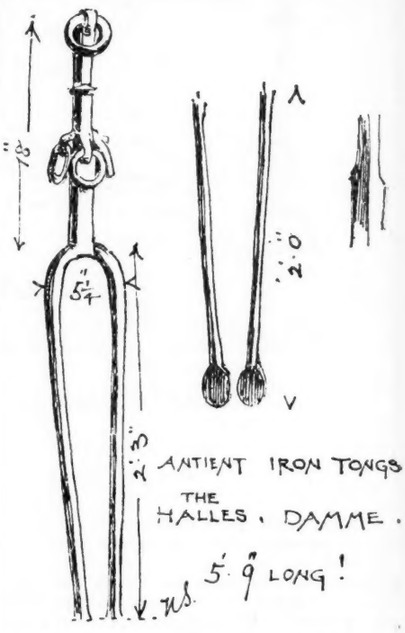
ribbed border; a sixteenth-century French fire-guard, with a border of acorns and oak leaves; a beautiful Dutch eighteenth-century oval brass repousée jardinière—the lower portion gadrooned; a French seventeenth-century stew-pan, with a ring of foliage ornament in relief; numerous candlesticks, brass lanterns, and candelabra.

I have not in all cases referred to old objects because of any distinct utility they necessarily possess at the present time, as you doubtless will have remarked, and of course I do not draw the line at old objects, but the time is limited this evening, and it would be impossible to dwell upon much modern work. I have here, however, some beautiful examples of copper and brass work, kindly lent by Mr. Mackmurdo, which you will see are cleverly and artistically designed and worked. There are three copper sconces with allegorical figure subjects, and two brass ones. Look at the fine way in which the heads of the figures are executed. They are not intended to be elaborate. They are really suggestive sketches, as it were, in the metal, which Mr. Mackmurdo himself designed, and had executed by his own artists, and there is a fine original treatment in the beaten brass-work which is thoroughly appropriate, and shows how well the capabilities of the metal have been understood. And please also observe the brass sconce, how simply it is treated, but with what admirable effect, due solely to the slightly-raised beadings, &c., the silhouette, and the tender convexities that have been raised on the main sheet of metal. I think they are fine lessons in themselves, and we are much indebted to Mr. Mackmurdo for his kindness in letting us have them to examine.

I am grateful to Mr. E. J. May, who has called my attention to the iron-work of some of the old-fashioned scale-makers (with its good colouring, and decorative brush ornamentation), which, as he points out, is no doubt traditional. Mr. May also kindly lends some interesting specimens of seventeenth-century Sussex iron-work, tongs, &c., which show thoughtful treatment. Mr. Guy Dawber kindly lends two fine Dutch candlesticks in brass, and a pair of Flemish pewter candlesticks of beautiful design. Mr. Hugh Stannus has gladly lent some specimens of old English brass candlesticks, and Mr. Francis Hooper some of his own sketches.

Allow me to remind you that the late and talented E. J. Tarver once sketched a good many of the old fanlight grille patterns which used to abound in London, and his sheet of sketches was published in the *Builder*. I think he rendered great service by doing so, as they are fast disappearing, and are certainly worthy of record.

In the study of all the old objects I look upon it as essential that we should critically examine them, bearing in mind the uses to which they were put in the olden times in order to realise the problem presented, its solution, and also the extent of legitimate embellishment, and how far



its application is satisfactory; *i.e.* (firstly), without deteriorating from the utility; (secondly) with the result of enhancing the appearance; (thirdly) while retaining in the form some suggestion of the function of the article which gives it the special character.

The obvious exigencies of modern life and the facilities of reproduction in manufacture compel repetition. With such opportunities of sowing it broadcast we have a strong argument in favour of good art, and of educating the community and familiarising them with beautiful forms and reasonable ornament. And it is the more necessary that this should be brought about, and that speedily, in order to remove an idea which largely prevails that it is merely the wealthy, or those possessed of ample means, within whose power it lies to acquire good honest design and work.

Nothing so much as the hurried march of modern times, with its great facilities of reproduction, has led to the truly appalling results of an uncouth desire to have something which is ambitious which we have witnessed, and which have been pitchforked at us from time to time, in the shape of bad copies of work of bygone ages made in a shoddy way, with no understanding of the old spirit, but in sickly nerveless imitation—sometimes in altogether different and inappropriate materials. As a mild instance of this, look at the way in which wrought-iron has been imitated in cast-iron. What a lack of resources!

Cheap ambitious church metal-work has long ago been loudly condemned, and quite properly, by all who know anything about the good work, because the former is so often a feeble attempt at copying the old work with no grasp of its character at all. But I have never yet seen much said on the subject of bad domestic metal-work, and I think I have urged sufficiently strong reasons for a protest.

There is a vulgarism which is frequently applied to persons or things which have not been improved by some change. It is the comprehensive expression "Its own mother would not recognise it," and this can be well hurled at such frauds as either the pseudo acanthus or honeysuckle, which have often been turned out to pervert the taste—nor would their respectively claimed prototypes own them if they could find anything at all recognisable about them.

I am reaching finality, and I have done scant justice to the subject, for it is impossible to say much in so short a time, and I have not even dwelt upon pewter or lead. There is such a wealth of design, too, in the old lead rain-water heads, broken up as they are with different returning planes and angular excrescences, embattled or ornamented with rope pattern, necked-heart or pear-shaped, funnelled from a square

pipe into a flat soffit, or the head itself gradually curving into the pipe. But I cannot dwell upon these nor many other works which so well merit our attention.

In conclusion, I will venture to say that I am struck by the want of restraint and simplicity in much of the manufactured metal-work of the day, especially in such utensils and objects of furniture as I have touched upon, while, on the other hand, in some things there appears to be a dearth of any large attempts at giving a little more interest to the work. This latter fault, I think, is noticeable in metal internal door furniture, which, although it possesses a purely utilitarian character, is often worthy of more thoughtful treatment, as, for example, better shaping or contouring of the handles, or more play of line in finger-plates without fear of destroying their usefulness. But the want of restraint is the greatest evil of all, and it undoubtedly requires much effort and patience on our part to exercise control, and simplify whenever we may be called upon to deal with ordinary manufactured goods. I have not referred to all the objects exhibited here, or which I have spoken of, because it invariably falls to our lot to select such; but they are part of my subject, and to some extent they go in conjunction with fittings. And the same spirit is met with in all good work, as regards the appropriate treatment of the metal or material. I also thought it would lend much additional interest to my paper. As architects, it is desirable we should take a keen interest in all specimens of workmanship, for we must be many-sided. It is on this account that I have not hesitated to bring before this senior section of the Architectural Association, at your kind invitation, a subject which is full of interest, and which, I venture to think, is as worthy your notice as some which might be considered more strictly practical matters which, perhaps, I could have spoken upon, but, I confess, with hardly the same enthusiasm. I hope I have made something of a case for Domestic Metal-work—at all events, that you will not convict me of being nebulous in my views about it.

Illustrations.

THE NEW REREDOS FOR THE CHURCH IN GORDON-SQUARE.

THE reredos is designed to be carried out in oak, and the panels are to be decorated in colours with figure subjects. The lines of the cornice and "tabernacle work" will be emphasised with gold. The stone carving in the church is now being carried out by Messrs. Brindley & Farmer, and promises to be most successful. The proportion and value of the several parts can now be better appreciated. It is to be hoped at last this fine cathedral-like building, designed by Mr. Brandon, may be completed. When this is done, and the unusual nakedness of the east end is remedied, there will be no finer church in London.

The present work is under the superintendence of Mr. John Belcher, Hanover-square, W.

HOUSE AT OXTED.

THIS house is now being built at Oxted. The walls are faced with red Dunton Green bricks, and the roofs are tiled. The stone dressings are of Monks Park. The whole of the woodwork inside and out will be stained dark brown.

The works are being carried out by Messrs. T. Turner, Limited, of Watford. The drawings from which these illustrations are taken were made by the architect, Mr. R. A. Briggs, from whose designs and under whose superintendence the house is being erected. Both the drawings were hung in the last Academy Exhibition.

THE ARCHITECTURAL ASSOCIATION:

PAPERS FOR THE NEW SESSION.

THE annual general meeting of the Architectural Association will be held on the 11th prox., when the President, Mr. W. D. Caröe, will deliver an address. The following is the scheme of papers for the approaching session:—November 8, "Pompeii," with lantern illustrations, by Mr. Talfourd Ely, M.A.; November 22, "The Municipal Control of Buildings," by Dr. G. B. Longstaff, L.C.C.; December 6, "Scenic Art," by Prof. Herkomer, A.R.A.; Dec. 20, "Brick-work," ——; "Lead-work," by Mr. C. Hill; "Wood-work," by Mr. R. Rust; 1896, January 10, "Municipal Buildings," by Mr. Henry T. Hare; January 24, "Copper," by Mr. Nelson Dawson; February 7, "Technical Institutes," by Mr. Sidney H. Wells; February 21, "The Modern Stencil," by Mr. Arthur Silver; March 6, "Masonry (Practical Stone-work)," by Mr. Hervey Flint; March 20, "The Architecture of the Teutonic Order, with particular reference to the Restoration of the Marienburg," by Mr. C. Fitzroy Doll; April 24, "The Present Position of Architecture at the Royal Academy," by Mr. Francis E. Masey; May 8, "Fabrics," by Mr. Aldam Heaton.

ARCHITECTURAL SOCIETIES.

PROPOSED ARCHITECTURAL SOCIETY, DEVONPORT.—A meeting of architects and assistants was held at the office of Mr. Henry George Luff, Devonport, on the 31st ult. Among those present were Messrs. Dwelly, Greenwood, Harris, Leest, Luff, Mill, and Shires. On the proposition of Mr. Luff, seconded by Mr. Greenwood, Mr. Priestley Shires was elected to the chair, and Mr. Edgar Leest was elected Honorary Secretary (*pro tem.*) The Chairman explained that the meeting had been called, on the proposition of Mr. Edgar Leest, to consider the advisability of forming a local Architectural Society, and he thought it was very desirable that such a Society should be formed for the general benefit of the profession. Mr. Luff proposed "That it is desirable to form an Architectural Society in the Three Towns, to be a branch of the Devon and Exeter Architectural Society, providing their terms are acceptable to the next meeting." Mr. Dwelly seconded the motion, which, on being put to the meeting, was carried unanimously, and the Hon. Secretary was directed to write the Devon and Exeter Society as to forming a branch. A vote of thanks was accorded the Chairman on the proposition of Mr. Greenwood, R.E.E., and seconded by Mr. Luff. The Hon. Secretary will be glad to give any information on the subject to those architects and assistants who were unavoidably prevented from attending, on application to Laboratory House, Mount Wise, or 64, Chapel-street, Devonport.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.—A new feature in connexion with the architectural classes of the Glasgow and West of Scotland Technical College, is the institution of day classes, which will meet every week on Mondays and Thursdays from 9.30 to 12.30. The lecturer is Professor Gourlay, who will deliver a junior course of sixty lectures, as well as a senior course of the same number, with tutorial instruction in the studio. The evening classes show that the number of lectures in the first and second courses in architecture are to be increased from sixteen to thirty in each course. In the first course Professor Gourlay will deal with architecture till the end of the Roman period. In the second course, which is specially arranged for Scotch students, he will deal with the English and French Mediæval, and afterwards with the Scotch, showing the influence of the English and French work upon the Scotch work of the same period. In the third course, he will treat of the history of architecture in general, and deal particularly with the Byzantine and the Renaissance periods. The courses in the studio and in construction are gradually being improved. Mr. Gourlay is assisted by Messrs. Lochhead, Fraser, and Moodie.

GLASGOW ARCHITECTURAL ASSOCIATION.—The opening meeting of the winter session of this Association was held on the 3rd inst. in the new rooms, 187, Pitt-street, Glasgow. The premises, which are jointly tenanted by the Glasgow Institute of Architects, were occupied for the first time, and there was a large attendance of members and others interested. General satisfaction was expressed at the manner in which the house has been adapted to the various requirements of the two Societies. After the preliminary business had been transacted, the President, Mr. Alexander N. Paterson, M.A., delivered an address. The first part was devoted to a survey of the work of the past session, particular reference being made to the progress of the schemes suggested by him in last year's Presidential Address. Whilst the projects for acquisition of improved premises, and co-operation with the Glasgow Institute of Architects had been successfully accomplished, the third—increase of membership—had been, to a certain extent, delayed, pending arrangement of the first-named schemes. With the additional attractions the Association now offered to the junior members of the profession he anticipated a large increase, and commended improvement in this respect to the energies of the members. Referring to the memorials addressed to the responsible authorities relative to the Tron steeple and cathedral, Mr. Paterson said, in so doing the Association was fulfilling one of its functions in the promotion of architecture in Glasgow, and indicated the action of the Corporation in entrusting the designing of public buildings to a section of a department primarily concerned in works of a purely utilitarian character, as a matter demanding immediate attention. He further suggested the institution of a class of lay members, gentlemen neither connected professionally nor inferentially with architecture, but who were interested in it for its own sake. The second part of the address was entitled "Archæology, History, and Art," between which, the lecturer continued, there existed an intimate relationship. The connecting link lay in the continuity, the traditional character of art, and particularly of architecture. To the architect who was ever seeking to assimilate and reproduce in his work the spirit of the old masters, even when endeavouring to solve the very different problems of the present day, the doctrine and practice of the ancients was of paramount importance. Proceeding to analyse and differentiate between archæology, history, and art, he said the first two were so closely interlinked that the one could scarcely be said to be complete without the other. Broadly speaking, however, the one was concerned with monuments, the other with events; the one with the actual details and arrangements of the buildings, the other with the significance of these as made clear by the habits and actions of the society of the time. Art was on an entirely different plane from the others, and for purposes of comparison with them, it might be expressed in its widest sense as the creation of the beautiful. Considering architecture as an actual occupation, not as a theoretical study, the relationship between the terms of the title might be concisely put by saying that art, from the architect's point of view, was concerned with the design and erection of buildings in the present time, that the art in these buildings was a necessary and natural outcome and development of similar works in the past, and that archæology and history were the branches of knowledge by which we best arrive at a knowledge of such work. Architecture, from its close dependence on construction, was of all the arts that most closely ruled by tradition. It was scarcely possible to think of design apart from those symbols and formulæ that have come down from the past. The insistence on the traditional, the national, and even the local type, constituted at once one of the main interests and healthiest signs of a living architecture. The lecturer went on to consider, on the one hand, how far the influence of archæology and history was beneficial and of real value in connexion with everyday work, and, on the other, whether such influence was not by some allowed to preponderate to a hurtful extent, and even at times to lead to a confusion of identity between the means and the end. Accepting archæology as a scientific aid to study, and associating with it its necessary complement of history, it was difficult to imagine any subject more worthy the attention of the architect. At the conclusion of his address, Mr. Paterson received a very hearty vote of thanks.

ENGINEERING SOCIETIES.

INSTITUTION OF CIVIL ENGINEERS.—The Council of the Institution of Civil Engineers invites Original Communications on the Subjects included in the following list, as well as on any other questions of professional interest. This list is to be taken merely as suggestive, and not in any sense as exhaustive. For approved papers the Council has the power to award premiums, arising out of special funds bequeathed for the purpose:—The most economical Methods of Handling large masses of Excavation, as exemplified in modern canal construction. The Measures necessary for the improvement of Canal Navigations. The Methods adopted in carrying out large Dock and Harbour Works, with descriptions of the Plant employed. The Appliances for Dredging and for Removing Rock in deep water, with details of the time occupied in the various operations. The Application of Compressed Air, steam and hydraulic power to Rock-drills. The Construction, Equipment, and Working of Light or Economical Railways of a permanent character. The Design and Construction of Railway Carriages, having reference to (*a*) lavatory accommodation; (*b*) provision for refreshments; and (*c*) sleeping arrangements. The Use of Compressed Air in Subaqueous Tunnelling. The Modern Methods of Pumping com-

pared as to cost and efficiency. The Use of Steel in the Construction of large Water-Tanks. The Employment of Storage-Reservoirs in Irrigation and in the Conservation of Rivers. The Purification of Sewage by precipitation, filtration, electrolytic, bacteriological, and chemical processes. The Use of Ash-bin Refuse in towns for the production of steam. The Purification of large quantities of Water after its use in Manufactories. The Methods of Enriching Coal-Gas and their effect on its calorific and illuminating values. The Production and Enrichment of Water Gas. The methods of conveying and of using Natural Gas. The Utilisation of Heat (*a*) generated in the compression of air and other gases; (*b*) carried away by steam-engine condenser-water; and (*c*) contained in boiler-furnace flue-gases. The Methods of Condensing Steam by the use of moderate quantities of water. The Methods of removing Moisture from Steam, and of reducing losses by radiation from steam-pipes. The Production and Use of Super-heated Steam. The Theory and Development of the Compound Steam-Turbine. The Recent Developments in Gas-Engines and Oil-Engines, including a comparison of the relative merits of the several Cycles, with reference to "after-burning." The Application of Oil- and Gas-Engines to tractive purposes on common roads and on tramways, and to the propulsion of vessels. The Design and Construction of large Turbines. The Methods of Testing the Lubricating Values of Oils, Greases, &c. The Comparative Merits of Blast- and Reverberatory Furnaces. The Influence of Carbon on Iron. The Magnetic Properties of Iron and Steel. The Manufacture of Steel for Structural Purposes. The Strength of Steel Shafts, Tubes, and Cylinders. The Efficiency of Centrifugal Fans for forced draught and for the Ventilation of Mines. The Drainage of Mines by Pumping and by Tunnelling. The Extraction of Metals from their Ores by electrolytic processes. The Occurrence, Production, and Uses of (*a*) Asbestos, (*b*) Arsenic, and (*c*) Mercury. Aluminium, its manufacture, properties, uses and alloys. The Metallurgy of Chromium, Molybdenum and other rare metals, and their use in the Manufacture of Steel. The design, construction, erection and working of Modern Stamp Mills. The Machines for Raising Mineral Tailings, as lifting-wheels, pumps, dredgers, &c. The most suitable Steam-power Equipments for Electric-light stations. The Utilisation of Electric-lighting Plant during hours of small demand. The Utilisation of Electrical Energy in the form of heat. The Regulation of Electric pressure in large lighting circuits as carried out at the engine, the dynamo, or the exciter. The Theory and Practice of the Transmission of Power by Alternating Currents. The Use of Electrical Motors for driving machines in textile factories and in engineering workshops. The first cost, facility, and economy of operation of Electrical Traction on Railways with heavy trains and on Tramways. The Construction and Working of Electrical Lifts and Cranes. The Electrolytic Action of Return Currents in Electrical Tramways on gas- and water-mains, and the best means of providing against Electrical Disturbances. The most suitable Alloys for the working parts of Pumps for lifting corrosive liquids from mines, &c. The Methods of Preventing or Arresting the Corrosion of Hydraulic Rams of large diameter. The Use of the Die-press in workshop operations. The Modern Rolling-Mills of the United States. The different systems of Refrigeration, and of appliances for the storage and Preservation of Food Produce. The Use of Electrical Machinery for lighting and the transmission of power in warships and in the mercantile marine.

Correspondence.

To the Editor of THE BUILDER.

ARCHITECTURE AT THE ROYAL ACADEMY.

SIR,—I would beg to solicit a corner of your valuable space to say a word in regard to Mr. Aitchison's proposal to admit models and photographs into the Architectural Room of the Royal Academy. It seems to me that Mr. Aitchison is regarding architecture as a fine art. Strictly speaking—and one cannot be too precise in a matter of this kind—architecture is not a fine art, the only fine art in connexion with building is that of architectural designing. Models and photographs of buildings are consequently inadmissible; they are not fine arts themselves, neither do they represent a fine art. It is impossible within the limits of a letter to deal with this important subject. I would venture to remark however, that, in my opinion, the policy pursued by the Academical Authorities during the last four or five years has been, to say the least, most unfortunate; the tendency is to encourage architects, who are pursuing their craft as a *business*, to the discouragement of those pursuing it as a *profession*, or, in plain words, to foster architectural advertisements, to the exclusion of architectural designs.

R. F. CHISHOLM.

Heidelberg,

SWANSEA SCHOOL BOARD COMPETITION.

SIR,—The terms of remuneration to architects were fixed against my advice.

E. R. ROBSON.

SIR,—I write to correct a mistake which I find I made. I stated that the rate of remuneration offered by the Swansea School Board on a former occasion was 4 per cent., including quantities, whereas, I find it was 5 per cent., including quantities, superintendence, and travelling expenses.

They also bound themselves to employ the architect to whom the first premium was given in case the work was carried out. I suppose the clause in this present case suggesting the "probability" of their employing the architect placed first is a "refinement" taught by experience.

H. W. WILLS.

The Student's Column.

METALS USED IN BUILDING.—X.

CALCIUM.

THE alkaline earthy metal calcium is not found in a free state in Nature, but it enters into the composition of a very large proportion of the earth's crust. In one form or another its compounds are exceedingly useful to the builder. We have not space to enter into details concerning their employment; on previous occasions our "Student's Column" has contained much relating to them in certain connexions, but the following summary will serve to impart a general idea of the uses of calcium compounds as a whole.

Calcite, or calcium carbonate, occurs both in an earthy and a crystalline condition; its chemical composition when pure is lime 56 per cent., carbonic acid 44 per cent. It is a comparatively soft mineral; even in the crystalline form it may be easily scratched by the point of a knife, and when earthy may be quite pulverulent. The chief varieties of carbonate of lime, so far as they affect our present inquiry, are:—

1. Limestone. In a more or less earthy condition this forms a common building stone, as, for examples, Bath and Portland oolites, and Ham Hill (shelly) and Totternhoe (chalk) stones. In a crystalline form it constitutes statuary (Carrara, &c.) marble, and fossiliferous marbles such as those from Devonshire, Derbyshire, &c.; also hard building stone, as at Hopton Wood, near Wirksworth. The harder limestones are commonly used locally as road-metal, for which purpose, however, they are not very suitable. On being calcined the carbonic acid present in the material is driven off, and thus ordinary builders' lime is made. Whiting is manufactured from chalk. The purer kinds of limestone are used as a flux with iron, &c., and they have abundant uses in other metallurgical operations.

2. Iceland spar; a pure and transparent form, very rare at the present time, is utilised for the polarisation of light.

3. Stalactites formed in caverns are polished as a species of marble.

4. Travertine, or calcareous tufa, made by the action of springs, the water of which is largely charged with carbonate of lime, is a somewhat cellular material, used as a building stone in certain parts of the world.

Aragonite has the same chemical composition as calcite, only it crystallises in a different system, and is not so durable as that mineral, further, it is heavier. It enters into the composition of certain limestones, and other building stones where its presence is very undesirable on account of its being so easily decomposed by atmospheric agencies.

Dolomite, or magnesian limestone, is carbonate of lime and carbonate of magnesia in about equal proportions. It is much used as a building stone, the Houses of Parliament being built of it, for instance. When in a crystalline condition, magnesian limestone is very durable, but when only partially so it makes a very inferior stone. Massive dolomite is manufactured into good hydraulic lime and basic bricks.

Gypsum, hydrous sulphate of lime (lime, sulphuric acid, and water). It occurs in massive beds, and when crystalline constitutes alabaster. On its water being driven off, it is ground up, in which form it is known as plaster of Paris; with the addition of certain other ingredients and careful preparation, it forms Keene's cement. Crystals of gypsum are called selenite, which can be made into cement of a high quality. A fibrous variety of gypsum, called satin-spar, is used for ornamental purposes. In common with other compounds of calcium, it is found in water, and assists to form "scale" inside boilers. Water containing much lime is said to be hard.

Fluor Spar, fluoride of calcium, is a source of hydrofluoric acid, of importance for producing ornamental patterns on glass. When fairly transparent, and of good colour, it is manufactured into vases and other ornaments ("Blue John"), especially in Derbyshire, where it is found in considerable quantities, though really handsome fluor-spar, is somewhat rare. The mineral is also used as a flux in many metallurgical operations.

CADMIUM.

This is a white, ductile metal found principally as a sulphide, of citron colour, which is used as a paint. It occurs in Renfrewshire, Bohemia, and at one or two localities in the United States.

SILVER.

When speaking of lead we remarked (*ante* p. 67), that when that ore was argentiferous, the silver was always extracted when present in sufficient quantity, but there are several other sources of the metal. The following brief summary gives a general conspectus of the principal ores of silver, viz.:—

1. *Native silver*, which generally contains small proportions of gold and copper. It is found as leaf-like pieces, sometimes as a number of crystals strung together like beads. It is readily recognised from its silver-white appearance when fresh, but on exposure to air it rapidly tarnishes, in which condition it might easily be mistaken for other minerals. An amalgam of silver with mercury occurs abundantly in parts of Chili. The native metal is often found also with platinum, bismuth, and antimony. It is readily converted, is comparatively soft, and soluble in nitric acid. Silver may be recovered from galena by cupellation, *i.e.*, by oxidising the latter. This process depends upon the facility with which the galena is converted into an oxide by the action of air at a high temperature, whilst silver is hardly affected; the lead-oxide being melted very readily is partly removed in a liquid state and partly absorbed by the porous hearth upon which the silver remains.

2. *Argentite*, silver glance, or sulphuret of silver, is a dull, dark-leaden ore, is not so heavy as the native silver, but contains about 87 per cent. of the precious metal when pure. It is the commonest ore of the metal, if we exclude argentiferous galena. As might naturally be supposed, the sulphide of silver is most abundant in association with the sulphides of other metals.

3. *Stephanite*, or brittle silver ore is a sulphide of silver and antimony, possessing about 68 per cent. of the former metal.

4. *Horn silver*, the chloride, occurs plentifully in Chili and Peru, sometimes in large fragments. Typical specimens exhibit a horn-like appearance.

5. *Pyrargyrite*, an ore of a dark-red colour, is sulphide of silver and antimony, with about 60 per cent. of silver.

6. *Proustite*, or light-red silver ore, is sulphide of silver and arsenic, having from 60-65 per cent. of the precious metal. This and pyrargyrite are often alluded to collectively as "ruby silver."

Two other ores of great value where occurring in any quantity are *Freieslebenite*, sulphide of silver, lead, and antimony, with about 22 per cent. of silver; and *Polybasite*, sulphide of silver, copper, antimony, and arsenic (quite black) contains about 70 per cent.

Silver occurs usually in veins or lodes, but at Stormont, in Southern Utah, is found impregnating beds of sandstone, interstratified with shale, being rich enough to be worked along three or four horizons. According to the observations* of Mr. W. Lindgren, the metal is distributed irregularly, and the mining is confined to rich "shoots" or "chimneys," which sometimes follow one particular stratum of the general ore-bearing bed, and sometimes cut across it. The

* "Trans. American Inst. M.E.," Vol. XV. (1886-87), p. 725.

ore exists as sulphide and chloride, but there is a little native silver; it is found principally along fractures or bedding planes.

As an example of the occurrence of the ore in one of the richest silver-producing districts in the world, we give the following illustration (fig. 9),

Fig. 9.

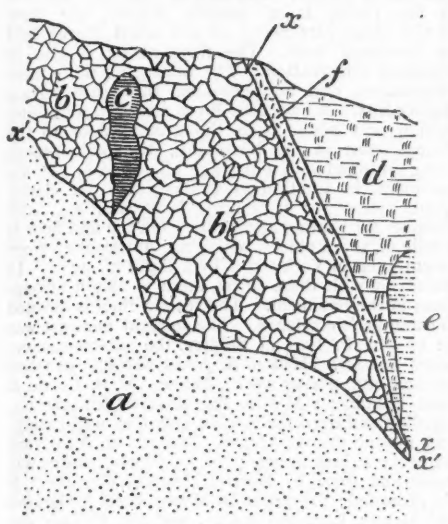


FIG. 9.—*Section of Phœnix Mine, Eureka, Nevada.*

a = Quartzite. *b* = Crushed limestone containing the ore (*c*). *d* = Limestone. *e* = Shale. *f* = Igneous rock. *x*, x^1 = Faults.

which relates to the Phœnix mine, on Ruby Hill, Eureka District, Nevada. From this we observe that the main features of the locality consist of quartzite (*a*) and limestone (*d*) between which is a mass of the limestone in a very much crushed condition (*b*) bounded by faults (*x*, x^1) at its junction with both the quartzite and normal limestone, or rather with the igneous rock (*f*), forming a dyke along the line of fault on the side nearest the limestone. Within the wedge-shaped body of crushed limestone all the ores of sufficient value to pay extraction occur.* As will be gathered from the diagram, the ore body is very irregular in shape, and this observation applies also to other mines in the neighbourhood, where the rich parts are of every conceivable shape and size, some measuring more than 100 ft. in all directions.

The following analysis of all the ores contained in these remarkable mines as smelted at a furnace in the district may be quoted :—

Chemical Composition of Ores, Eureka District, Nevada.

Lead oxide	35·65
Bismuth	—
Copper oxide	·15
Iron sesquioxide	34·39
Zinc oxide	2·37
Manganese oxide	·13
Arsenic acid	6·34
Antimony	·25
Sulphuric acid	4·18
Chlorine	—
Silica	2·95
Alumina	·64
Lime	1·14
Magnesia	·41
Water and carbonic acid	10·90
Silver and gold	·10

The proportion of silver and gold here would seem to those unaccustomed to the examination of ores to be very minute. Yet put in another way, a short ton (2,000 lbs.) of such ore, would yield 27·55 troy ounces of silver, and 1·59 troy ounces of gold — which are regarded as high percentages.

It is stated that some part, at least, of what is called lead oxide in the above analysis must be lead sulphide. Other analyses of the ores in this marvellously rich mineral district, demonstrate the existence of silver to the extent of 1·01 per cent., and gold ·001 per cent.; the gold pays for extraction. Other localities producing silver in large quantities are "Comstock Lode," Nevada; Battle district, Montana; Huanchaca, in Bolivia; and Broken Hill, in New South Wales. The enormous quantities of lead and silver raised in the mines at the last-mentioned locality within the last few years have completely revolutionised the market in those metals; it has been a prime factor in sealing the doom of all but very rich lead mines in the Mother Country.

* *Cf.* "Monographs U.S. Geol. Surv.," Vol. XX. 1892), p. 307; also Vol. VII. (1884).

GOLD.

This mineral is nearly always found in the native state, but occurs also in combination with bismuth and tellurium. We cannot devote much space to it as its uses in the building arts are, naturally, rather restricted. It is found in every possible manner in nature—in veins, beds, and "masses." We gave some idea of its mode of occurrence in irregular ore bodies when dealing with silver. In California, gold is found in a vein of quartz and magnesite running through serpentine and slates. The following diagram (fig. 10) shows the way in which it often occurs in quartz

Fig. 10.

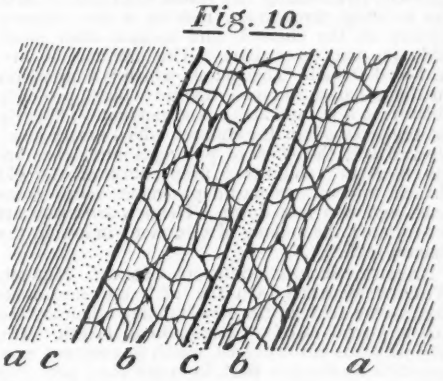


FIG. 10.—*Section across an auriferous "quartz reef," Glendhu, Victoria.*

a = Grey satin-shales. *b* = Quartz. *c* = White. felspathic rock.

"reefs," or veins in Victoria, Australia. Here the reef, about three feet in width, is divided into two parts by a felspathic rock, the gold being disseminated throughout in minute grains and flakes.

Fig. 11 represents a modification of the ordinary quartz reef, as exhibited in one of the mines at Fryer's Creek, in the same colony. In this,

Fig. 11.

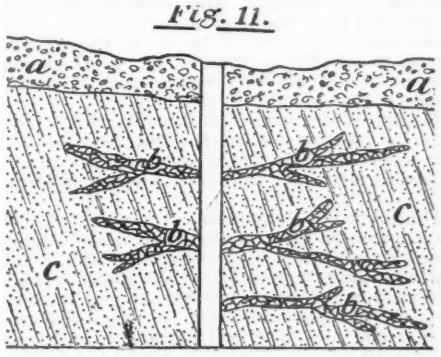


FIG. 11.—*Auriferous quartz branching veins, Fryer's Creek, Victoria.*

a = Auriferous gully. *b* = Small quartz veins. *c* = Sandstone.

small quartz veins (*b*) from 1 to 3 in. thick only, but highly auriferous, intersect the strata (*c*) irregularly. After sending out several branches, however, these veins thin out to a mere thread, and ultimately disappear.

In several parts of the world gold is found in alluvial soil and gravels, having been derived from the destruction by denudation of gold-bearing quartz reefs and other kinds of auriferous rock in the same manner as the gravel and sand amongst which it occurs. Such rich alluvial deposits may be traced up the river valley until, perchance, the reef, or rock, from which the precious metal originally came is discovered. Not unfrequently, however, the rock *in situ* is covered over by alluvium, or otherwise masked.

Fig. 12 gives a mode of occurence of gold in the well-known district of Johannesburg, South Africa. The metal is here found in conglomerates which, for the most part, consist of pebbles of white quartz. The greater portion of the gold exists, however, in the cementing material—but very little appearing in the quartz. It is a misnomer to call these conglomerates "reefs," or "veins"; they are true "beds," but we have followed the usual nomenclature as set forth by Mr. Walcot Gibson, who has described* the gold-bearing rocks of South Transvaal in much detail, and from whose work the diagram (fig. 12), in a modified form, is taken. The gold-bearing conglomerates (*c*, *e*, *g*, *j*) are almost vertically disposed.

In Alaska the metal occurs in altered granite, and is worked in the open. A very curious example is constituted by the Mount Morgan Gold deposits near Rockhampton, Queensland. There the ore, which is worked in a quarry, is found in sinter and hæmatite; some of the rock is spongy, being so light that it will float upon water. The origin of the whole is extremely puzzling, but the Government Geologist for the Colony believes that the sinter, at any rate, has originated by geyser action.

The use of silver and gold in the building trades is limited almost exclusively to ornamental work. Both metals can be beaten out into such thin leaf, being so highly malleable, it is not remarkable that they are especially suited to the purpose. Silver-leaf is applied to non-metallic things by means of some adhesive liquid such as size or gum. In covering metallic objects these latter are heated to remove grease and the surface specially prepared. It may be remarked that aluminium leaf is now to some extent displacing silver-leaf, and there are various substitutes for silvering and gilding in which not a particle of these valuable metals is to be found. Ornamental and plate work is also covered by a thin film of silver by electro-deposition. Silver is such a soft metal that without an alloy of some kind it soon wears away, and a large quantity of so-called silver goods contain much also of the baser metals. Alloys of silver, which we shall describe in their proper place, are of great use from many points of view.

In addition to leaf and thin plates, gold is employed for wash-gilding, a process effected with an amalgam of gold, prepared by dissolving one part of fine gold in eight parts of mercury. Electro-gilding is accomplished by immersing the thoroughly-cleansed articles to be gilded in a solution of gold, connected with a galvanic battery. But we have no intention of writing a dissertation on the art of gilding or gold-plating, and there are many other processes for accomplishing these things than we have indicated.

* "Quart. Journ. Geological Soc.," Vol. XLVIII. (1892), p. 410.

GENERAL BUILDING NEWS.

SCHOOLS, DUBLIN.—New Catholic schools are being built in Great Brunswick-street, Dublin, for St. Andrew's parish. The total length of the building is 145 ft., and comprises a main block with central projection and wings at the ends, the whole being two stories in height. On each floor there are two schoolrooms 52 ft. by 31 ft. in the main block with class-rooms 33 ft. by 18 ft. in the wings. Entrance-halls, having staircases, include the necessary cloak-rooms. The height of the ground floor story is 15 ft. and the upper story 18 ft., including cove. The upper floors are carried on steel girders. Exhaust ventilators in the roofs and elsewhere are provided to carry off the vitiated air, whilst all the windows are formed with opening compartments in the sashes and fresh-air inlets in the window-seats. The walls are built of Co. Dublin stock-bricks, pointed with quoins and dress-

Fig. 12.

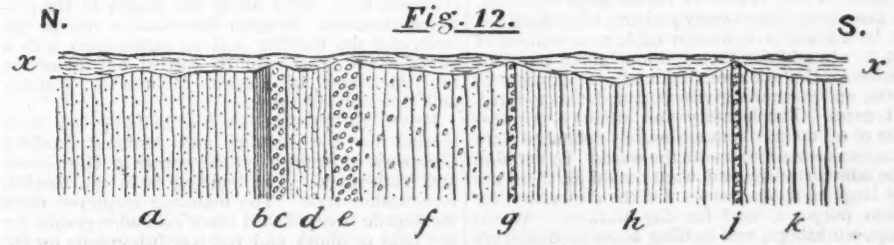


FIG. 12.—*Section, Salisbury Gold Mine, near Johannesburg, South Africa.*

a = Red, flaggy decomposed sandstone, 30 ft. *b* = White and blue clay, 6 in. *c* = Red conglomerate (North reef), 1 ft. to 3 ft. *d* = Red and white micaceous sandstone, 8 ft. *e* = Red loose conglomerate (main reef), 12 ft. to 15 ft. *f* = Fine conglomerate and grit, 24 ft. *g* = Red conglomerate (main reef leader), 6 in. to 2 ft. *h* = Coarse compressed grit, 34 ft. *j* = Red conglomerate (South reef), 6 in. to 2 ft. *k* = Hard grit. *x* = Superficial red soil.

ings of red brick and bands of same. The central projection is treated as a prominent feature in red terra-cotta, and at the intersection of the roofs is placed the main exhaust ventilator, designed in the form of a turret. The schools have been designed by and are being carried out under the supervision of Mr. William Hague, architect, Dublin, the firm of Messrs. Michael Meade & Son being the contractors.

ADAM SMITH AND BEVERIDGE MEMORIAL HALLS, KIRKCALDY.—At a recent meeting of the Joint Committee of the Adam Smith and Beveridge Memorial Halls, a report on the estimates was submitted by Mr. James K. Dunn, of Messrs. Dunn & Findlay, architects, Edinburgh, showing that the entire cost of the buildings would be considerably under the probable estimate if executed in stone from the Grange Quarry, Burntisland. A recommendation that red stone should be used, and that the principal fronts be of ashlar, was carried by a majority, at an increased cost of 900*l.* sterling. The original estimate by the architects was 12,800*l.*, and the entire amount of estimates submitted was 12,304*l.* With the fronts in red stone and executed in ashlar, and with the addition of buttresses at clearstory, the cost will be increased to about 14,000*l.* It is expected the work will be started immediately.

NEW WARD, BIDEFORD INFIRMARY.—The boardroom of the Bideford Infirmary has been converted into a children's ward, and a new boardroom erected, with waiting-room for out-patients underneath. Mr. R. T. Hookway was the architect, and the work has been completed by Mr. E. Ellis.

SCHOOL, OCKBROOK AND BORROWASH, DERBYSHIRE.—Two new class-rooms, providing accommodation for seventy-five additional scholars, and three cloak-rooms, for boys, girls, and infants, have been added to this school. The work has been carried out under the direction of Mr. Percy Currey, architect, Derby, by Mr. J. Clifford, builder, Borrowash.

CHURCH FOR THE DEAF AND DUMB, SOUTHAMPTON.—A new Mission Church, situated in Oak-road, Northampton, close to the parish church of St. Augustine's, has just been opened by the Bishop of Southampton. The building was formerly a mission hall, but has been considerably altered. It was formerly low and dark, but has been raised in height and lightened and a new chancel added. The old plain square windows have given way to tracery windows. A dado has been run round the new church, and a wood-block floor laid down. The chancel-floor and steps are of oak, and also the other fittings. There are three stained-glass windows in the chancel. A door on the left of the chancel leads to the vestry and the ground outside, where it is proposed later to erect a club or recreation-room. The architect for the new building was Mr. J. E. Batchelor, of Salisbury, and the builder, Mr. H. J. Kite, of the same town. The new building is intended to accommodate an ordinary congregation of about 100.

TECHNICAL SCHOOL, ACCRINGTON.—The new technical school which has been erected by the Corporation of Accrington was opened on the 28th ult. by Mr. Alderman Snape. The building, the exterior of which is entirely of stone, is in the Blackburn-road. The architect was Mr. Henry Ross. Accommodation is made for the teaching, not only of technical subjects more or less connected with the industries of the town and district, but of art and science in their various branches. The cost of the whole is about 12,000*l.*

INFECTIOUS DISEASES HOSPITAL, GLASGOW.—The memorial stone of the new Glasgow hospital for infectious diseases, now in course of erection in Ruchill Park, in the north-western district of the city, was laid on the 29th ult., by Lady Bell. When completed, the entire hospital buildings are to be surrounded by a wall nine feet in height, to be screened from public view later on by a fringe of trees and shrubbery. The entrance is to be in Bilsland Drive. The single entrance is a special feature of the hospital. Inside the gateway there will be situated the houses for the detached officials, such as the house steward and the master of works. The carriage-drive leads by the right direct to the administrative block, a building constructed of red sandstone. Within this building is to be provided accommodation for the medical and nursing staff, including recreation rooms and separate dormitories for 206 nurses. Behind this block the pavilions for the treatment of patients have been arranged. These consist of twelve large buildings, each to accommodate twenty patients, while each bed is to be allowed a minimum cubic measurement of 2,000 ft. In addition there are four small pavilions intended for the accommodation of special cases of disease, and these will give accommodation to forty-eight cases. The lavatory and sanitary arrangements of all the pavilions are entirely detatched from atmospheric connection with the wards. In addition to the administrative and ward buildings, there are to be large buildings erected for the dispensary, for kitchen purposes, and for day workers. Washhouses, workshops, and stabling accommodation are likewise provided for, and in the centre of the buildings there will be a water-tower. The estimated cost of the whole of the buildings is 250,000*l.* Dr. J. B. Russell, Medical Officer for the city, and Mr. A. B. M'Donald, City Engineer, are mainly responsible for the designing and internal planning of the hospital.

CALVINISTIC METHODIST CHAPEL, RHYL.—The memorial-stones were laid on the 2nd inst. of the new Calvinistic Methodist Chapel in Warren-road, Rhyl. The building is in the Elizabethan style, and will seat about 600 people. The total cost is about 2,000*l.* The architect is Mr. Thomas Parry, of Colwyn Bay, and the contract has been entrusted to Mr. Hugh Jones, Rhyl.

RESTORATION OF WISTANSTOW CHURCH, SALOP.—The parish church of Wistanstow was reopened recently, after restoration, by the Bishop of Hereford. The improvements comprise building a new vestry and organ-chamber, partially reseating the body of the church, making improvements to the organ, restoring the old oak perpendicular roof of the nave, re-colouring the inside walls and roofs of the building throughout, making a new dormer window in the chancel, and various other small additions and alterations. The architect is Mr. A. Lloyd Oswell. The church, which is a cruciform building, has a Norman doorway built probably about 1160 A.D., and also a Norman font. Till lately the organ stood in the chancel, which it very much blocked up; the effect of putting it into a chamber has been to exhibit the proportions of the old chancel and the encaustic pavement which some years ago was laid down. The new arrangements necessitated the making of a dormer window in the chancel roof.

BAPTIST SUNDAY-SCHOOLS, SMALL HEATH, WORCESTERSHIRE.—On the 28th ult. memorial-stones were laid at the new building adjoining the Coventry-road Baptist Chapel, Small Heath. The original plans of the chapel, which was erected at a considerable distance back from the road, provided for the erection, at some future time, of frontage to the chapel, comprising lecture-hall, &c., and the Sunday-schools, the building of which has just been commenced. There is a large room, 60 ft. by 31 ft., and five large class-rooms. The architects are Messrs. Ingall & Son, and the builder, Mr. Hougham.

ADDITIONS TO SCHOOL, TAUNTON.—The additions to the Huish School are approaching completion. The school will be about half as large again as formerly, the new rooms being a lecture-room, 30 ft. by 20 ft., a laboratory 27 ft. by 20 ft., and a workroom 25 ft. by 20 ft. The new part is in the same style as the other portion, being of brick with dressings of Ham Hill stone, and connexion is afforded by a corridor. The house of the headmaster has been improved and renovated. The contractor for the school is Mr. G H. Pollard, and for the house Mr. J. Morse. Mr. J. Houghton Spencer is architect for the whole, and Mr. T. R. James, of Exeter, was clerk of the works.

HOTEL, WALLSEND.—The Carville Hotel, Carville-road, Wallsend, which has just been erected, was designed by Mr. Hope, architect, Shields and Newcastle, and built by Messrs. Simpson, builders, Shields and Blyth.

HIGH SCHOOL, ARBROATH.—A new High School for Arbroath, in place of the former school erected about seventy years ago, was opened on the 2nd inst. on a site at Kegstie Hill. The school contains secondary, middle and fee-paying and grant-earning elementary departments, with a department for science and art. The building was erected from designs by Messrs. Carver & Symon, architects, Arbroath and Forfar.

RESTORATION OF ARDGLASS CHURCH, IRELAND.—This church, which has been closed since Easter Day, has been restored. Mr. E. N. Banks, C.E., of Belfast, has been the architect, the work being carried out by Mr. John Apsley, contractor, of Belfast.

THE GRAND CLOTHING HALL, SHEFFIELD.—In connexion with the widening of High-street, Sheffield, the premises of the Grand Clothing Hall Company will be set back about 40 ft. The new building will be arranged in a somewhat similar way to the existing one: a large saleshop on the ground floor and showrooms and offices on the first and second floors. The roof will be covered with Mellow's special glazing, and a large well will be left in the centre of the floors in order to provide light in the saleshop below. The basement will be utilised for stores, heating chambers, and electric-light apparatus, and at the rear an outside staircase will lead to workmen's shops. A staircase will lead from the saleshop to the upper floors. The new building will be one story higher than the present premises, 65 ft. being about the height of the proposed structure. English Renaissance will be the style, and the building will be surmounted with a gable. The work will be carried out under the superintendence of Messrs. Holmes & Watson, architects and surveyors.

BANK, SHEFFIELD.—A new building has been erected for the London and Midland Banking Company, in Sheffield, at the corner of High-street and York-street. The building is in the English Renaissance style. The materials employed upon the façade are polished black Labrador granite for the base or plinth and red Swedish granite for the pilasters. The ashlar stone in the upper part of the building is from Varley's Huddersfield quarries. The entrance to the new bank—with a carved panel over the doorway, with heraldic shields representing the arms of some of the towns and cities where the company have their head offices and banks—is at the angle of High-street and York-street. Folding polished walnut doors lead into the banking office, which is about 56 ft. by 28 ft. wide, and 18 ft. high. The walls and columns are lined with a polished walnut dado, and above that with Pavonazza and Siena marbles, with a modelled frieze and panelled ceilings and cornice. The fixtures and bank fittings, including the counter and screens, are of panelled and carved walnut. The floor of that part allotted to the public is of marble mosaic, the floor of the other part being of red wood blocks laid on fire-proof floor. The floor above is also of fire-proof construction. The manager's office faces High-street, and is approached through a private inquiry box. A hydraulic lift is arranged for taking bullion and books from the ground floor to the strong-rooms in the basement; the bullion-room being arranged with a passage all round it. In the basement, in addition to strong-rooms, are clerks' room, stores for stationery, lavatories, &c., and chamber for heating apparatus. On the first floor is a suite of seven offices, which are approached from an entrance in York-street by a flight of stairs. In connexion with these offices there is also a strong-room in the basement. The second floor is devoted to caretaker's residence. The general contract was let to Mr. F. Ives, of Shipley, the sub-contractors being Messrs. Hodkin & Jones for the panelled ceilings and plaster work; Messrs. J. B. Corrie & Sons, plumbers; Messrs. Pattinson, of Manchester, supplied and fixed the marble columns, wall casing, and mosaic floors; Messrs. Johnson & Appleyard made the walnut fittings; the heating apparatus was made and fixed by Messrs. Newton, Chambers, & Co., Limited; the stoves by Messrs. Steel & Garland and Messrs. Longden & Co.; and Mr. F. Tory was the sculptor for the stone and woodwork. The whole of the external and internal work has been carried out from the designs and under the superintendence of Messrs. Holmes & Watson, architects, Sheffield.

BUSINESS PREMISES, SHEFFIELD.—New premises are to be erected for Messrs W. Foster & Son Limited, on the South side of High-street, Sheffield. The frontage to the new street line will be upwards of 120 ft. Messrs. Flockton & Gibbs are the architects.

SANITARY AND ENGINEERING NEWS.

ELECTRIC INDICATING APPARATUS, WEYMOUTH WATERWORKS.—The directors of the Weymouth Waterworks Company, acting upon the advice of their engineers, Messrs. Crickmay & Sons, have instructed Mr. George Jennings, of Lambeth, London, to carry out an installation of his patent electrical indicating and recording apparatus between the reservoir and engine-house. By the adoption of this apparatus the level of water from the reservoir will be shown in the engine-house at all hours of the day and night throughout the year, and a record of the varying depth will be automatically registered for reference. A similar apparatus will shortly be fixed at the Great Yarmouth Sewage Pumping Works.

EXTENSION OF WEDNESBURY SEWERAGE WORKS.—On the 28th ult. Colonel Langton Coke, on behalf of the Local Government Board, held an inquiry at the Town Hall, Wednesbury, into an application made by the Wednesbury Town Council for sanction to borrow 7,500*l.* for the construction of sewerage and sewage-disposal works. Mr. Edward Pritchard, C.E., of Birmingham (Engineer to the Corporation), attended to explain the scheme.

COVERING-IN OF BROUGHTON BURN, EDINBURGH.—The Streets and Buildings Committee of Edinburgh Town Council have resolved to recommend the acceptance of an estimate, amounting to 6,000*l.*, for covering in the Broughton Burn. The work is to be done at the sight of the Burgh Engineer. The portion of the Broughton Burn which remains to be covered in extends from the rear of the Catholic Apostolic Church at the foot of Broughton-street as far as a point near the North Leith branch of the North British Railway Company, in the vicinity of Powderhall Station. Part of the contract is also to cover in the Gayfield Burn, so far as it runs open, from near the foot of Annandale-street to a point at the north-east corner of the grounds of Gayfield House, where it will join the Broughton Burn sewer.

STAINED GLASS AND DECORATION.

CHURCH DECORATION, GLASGOW.—The Congregational Church in Eglinton-street, Glasgow, has just undergone a process of internal renovation. About six months ago the deacons requested Mr. A. J. Anderson, A.R.I.B.A., of Glasgow, to submit drawings of a scheme of colour and advise as to improvements in lighting; and the design which he submitted is that which has just been carried into effect. Continental examples of Romanesque decoration have largely suggested the ornamental detail. A feature is the treatment of the eastern wall, extending for the full width of the structure, and blank, except for a small circular window—the motive being a veil of gold cloth divided by illuminated vertical bands at irregular intervals, and of different colours. On these are emblazoned in gold the emblems of the Saviour as found in early

Christian buildings, suggesting, to some extent, the *Iconostasis* of an Eastern church, with the important difference that it does not intervene between the people and the ordinances. Mr. James Mordis, of Sauchiehall-street, carried out the painting, and Messrs. James Moodie & Son, of Edinburgh and Glasgow, supplied, to the architect's drawings, the wrought-iron and copper coronas.

WINDOW, STOKENCHURCH CHURCH, BUCKS.—The east window of the parish church. Stokenchurch, Bucks, has just been filled with stained glass by Mayer & Co., of Munich and London. The subjects are the Nativity, Crucifixion, and Ascension.

MURAL PAINTINGS, ST. GILES' CHURCH, SOUTH MIMMS, N.—On Sunday last the dedication of two mural paintings took place in St. Giles' Church, South Mimms, N. The work consists of paintings of the Twelve Apostles on gold back-grounds, supported by painted canopies, after the existing work in the church. Each apostle is typified by his attendant symbol as demonstrated on the examples in some of our Norfolk churches. The panels are on thick linoleum, and fixed to the walls by a damp-proof process. The work has been carried out by Messrs. H. G. Bartlett & Co., Brixton.

FOREIGN AND COLONIAL.

FRANCE.—The Ouest Railway Company are about to rebuild the railway bridge which crosses the two arms of the Seine at Bizons, on the Paris and Rouen Railway.——At Perpignan, a few days ago, a fine monument was inaugurated to the memory of the soldiers of the Pyrenées Orientales who fell in the Franco-German war. The monument stands at a meeting-point of the Promenades, and is in red marble. The general design is by M. Carbasse, an architect of the Department, and includes a bronze statue of "Revenge," by M. Jean Belloc.——The Fine Art Society of Valenciennes will open its annual exhibition on the 21st, to remain open till October 14.——The Château of Largoët, about ten miles from Vannes, is to be put up for sale. It is one of the most r emarkable specimens of Mediæval military architecture in France.——M. Falguière has been commissioned to execute the statue of Cardinal Lavigerie, which is to be erected at Bayonne.——MM. Massoules and Dagonet, sculptors, and M. Gillet, architect, have been jointly commissioned to execute the monument to be erected to President Carnot at Châlons-sur-Marne.——The Municipality of Bordeaux are preparing grand fêtes in honour of the Lord Mayor of London, who is shortly to pay a visit to the Exhibition at that city.——The Architectural Society of the Saône and Loire has appointed M. Pinchard, of Macon, as its President for 1895-1896. M. Ferret, of Bourg, and M. Pelletier, of Lons-le-Saulnier, have been elected Vice-Presidents of the same Society.——The death is announced of M. Bonzi, the painter, who from 1855 to 1891 was Curator of the Museum at Toulon.——M. Paulin Tasset, a medal engraver of great talent, has been made Chevalier of the Legion of Honour.

GERMANY.—The new Imperial Law Courts at Leipsic will be opened on October 26. The Emperor and the King of Saxony will attend the ceremony. Herr Ludwig Hoffmann is the architect of the building, which has taken about eight years to build, and as a German public building is only second in importance to the Imperial Houses of Parliament at Berlin.——Schliemann's monument at Schwerin was unveiled last week. The monument is in the form of a bronze bust on a granite pediment, and has been placed near the Pfaffenteich. Herr Berwald is the sculptor.——The Berlin University has conferred the honorary degree of a Doctor on "ober Baudirector" Spieker. As we notified some weeks back, Herr Spieker retires from the important office of Architect-in-Chief to the Prussian Commissioners of Works. The distinction is an acknowledgment of the efforts of Herr Spieker to improve the German University buildings, chemical laboratories, and observatories. The Emperor has also conferred a high distinction on the retiring official. Herr Lorenz will be his successor.——A number of the Berlin bridges over the River Spree and the Berlin canals are being rebuilt, and the work will be completed in time for the opening of the Industrial Exhibition next year. Of the bridges in hand, the "Oberbaum" Bridge, the "Lange" Bridge, and the "Gertrauten" Bridge are the most important.——A large bathing establishment, known as the Bath's Club House, has been opened at Berlin under the auspices of a bathing and swimming society. Besides the large swimming-baths for men and women, there are Turkish baths and medical baths of every description. Messrs. Ende & Boeckmann are the architects, and their work is considered very successful. The swimming-baths have each a water surface of about 500 yards super.——The *Baugewerks Zeitung* publishes some interesting statistics on the gradual decrease of the building activity in Berlin. It appears that, whilst 2,800,000*l.* were spent in wages to the building trade in 1891, only 2,300,000*l.* were spent in 1894.——The Berlin Press complains of the vandalism of the Government in having temporarily let the old Houses of Parliament as a place of amusement and eating-house. The old Council Chamber was first used as a kind of bazaar, and now it has been turned into a "model eating-house." The Government might surely have put the building to some other use, especially as there is a scarcity of office accommodation for the public departments.——The Prussian Minister of Works has decided that an inspection of all the gas and electric fittings in the theatres, music-halls, and assembly-rooms throughout Prussia shall henceforth be made by the Building Act Departments of the cities in which they stand.——Herr Arntz is to be the new Cathedral architect at Strassburg. Herr Arntz was employed on the St. Stephen's *atelier* at Vienna, and has held other important offices.——A number of improvements are to be carried out in Hanover. Besides the new Town Hall, for the design of which a competition has been opened, there will be a new museum. The wood market is to have some sculptural decoration, for which a competition has also been opened, and the "Marsch" district is to be newly laid out. The Court Theatre is being greatly improved, and a new hydraulic stage is proposed from plans by Herr Brandt, of the Berlin Opera House. The most important of the new works is undoubtedly the proposed Town Hall, which will cost over 200,000*l.* The Mayor's parlour and reception-rooms are, alone, to have a superficial area of 900 square yards.

AUSTRIA.—Herr Lichtblau, one of the leading building officials of the Vienna Municipality, has just died at the early age of fifty-three. Besides having attained a very high position in his profession, Herr Lichtblau was exceedingly popular, and kept well in touch with architects of other countries.——The Austrian Government has practically decided on the erection of special hospitals or "homes" for habitual drunkards, instead of reserving wards for them in the hospitals.——An Arts and Crafts Museum is to be formed at Budapest under the auspices of the Hungarian Government, and the custodian of the Hungarian National Gallery has been sent to Italy to purchase some works to start the collection with. The preliminary vote for this purpose is 35,000*l.*——In connexion with the completion of the Hofburg Palace front, looking towards Michael's Place, two new fountains are being erected, and have been so designed as to lean against the new façade. Professors Wehr and Hellmer respectively hold the commissions for carrying out these fountains.——The Royal Commission which has the control of the whole of the improvements which are being made at Vienna had a meeting on the 30th ult., at which a number of important questions were decided. Among these we notice that in order to economise, instructions have been given to reduce the proposed expenditure on the architectural rendering of the new metropolitan railway stations. The decoration of these stations is to be subject to the amounts, if any, voluntarily collected by adjoining owners for their beautification. We trust that the Viennese will respond to the call, and not have their city spoilt on account of the economical policy of the Royal Commission. It is of interest to note that nearly 5,000 men are already employed on the improvements.

RUSSIA.—St. Petersburg is to have a new museum and picture-gallery, which will be known as the "Alexandra III. Museum." The deceased Czar had a scheme prepared for this museum, and we are pleased to see that the Emperor Nicholas intends carrying out his deceased father's ideas. The museum will be essentially a national one, only containing works by Russian artists. The collections will be arranged in the Michael Palace, which has been bought out of the funds of the Privy Purse from the municipality of St. Petersburg. The Grand Duke Michailowitch will temporarily have charge of the museum, and be responsible for its arrangement.——No steps have, however, yet been taken by the new Czar to carry out the Opera-house which Alexandra III. had intended to erect, but we understand that the scheme is still under consideration. The deceased Czar passed the plans shortly before his death, and the works were to have been started this year. The term of mourning, &c., however, apparently prevents any immediate action being taken for a building of this class. The design passed was by Professor Schroeter, and was recently illustrated in the *Builder*.

MISCELLANEOUS.

BOURNE VALLEY POTTERY, BOURNEMOUTH (Henry Sharp, Jones, & Co., Ltd.).—This property was offered by auction on Thursday last week by Messrs. Hankinson & Son, of Bournemouth. The sale was held in the brickmaking house on the premises. The property was eventually sold for 20,005*l.*, the purchaser being Mr. Frederick Sharp.

LAND SALE, WEST WORTHING.—Mr. Douglas Young, Coleman-street, E.C., on the 29th ult. held a sale of the remaining portion of the Liberator land at West Worthing, which realised nearly 20,000*l.*

SMOKE-CONSUMING APPARATUS EXPERIMENT IN EDINBURGH.—A smoke-consuming apparatus, patented by Mr. William M'Glashan, consulting engineer and surveyor, Leith, was tested at the Royal Infirmary, Edinburgh, on the 23rd ult. It is a method of consuming smoke in the flues before it can reach the chimney, and it can be applied to existing boilers without any alterations. A tank of crude oil is placed at a given height above the furnace; pipes are led from this tank down to the mouth of the ashpit, thence along the ashpit, passing through the bridge into a chamber. The end of this pipe is fitted with a brass plug, into which is perforated a small needle hole, through which the oil is forced, by reason of the tank being so much higher. The ordinary pigeon door in the ashpit is opened a little to admit air to mix with the oil, which, in conjunction with the smoke and waste gases, bursts into flame, thus consuming the smoke; hence, instead of the smoke passing along the flues, flame takes its place, which keeps the flues clean, and augments the power of the boiler. Automatic gear is fitted for the purpose of economising the oil as much as possible, and works as follows:—When the fire door is opened for the charging of the furnace with fuel, gear attached to it opens the cock at the tank, which allows the oil to operate at once, and also fills up a glass cylinder to the desired height, this being capable of being altered at will, by moving the piston which is in the cylinder, either up or down as required, thus reducing the consumption to a minimum. Sufficient oil having been expended to consume the smoke, and the fire having become bright, no more oil is used until the next charging of the furnace takes place. In the course of the test the furnaces were fired heavy so as to cause dense smoke to be emitted from the chimney. The apparatus was then applied, which cut off the smoke entirely. The apparatus was then shut off, which allowed the smoke to leave the chimney in volumes. This operation was executed seven or eight times out of the once firing of the furnaces, thus showing that the apparatus had quite a command of the smoke.—*The Scotsman*.

AMSTERDAM FIRE CONGRESS.—This gathering, to which we referred last week, will take place from the 24th to 28th inst., and we understand that English architects and engineers are most cordially invited to attend the discussions. We have received a list of the subjects on the agenda paper, and find that the work of Group 3 will be of special interest to architects. The final list of the three groups, with their sub-sections, stands as follows:—*Group* 1.—Fire prevention: storage of inflammable merchandise; construction of ovens, fireplaces, furnaces, chimneys, &c.; spontaneous ignition and its prevention; flash point of petroleum; construction of petroleum lamps and stoves; electric installations; lightning conductors. *Group* 2.—Fire extinction and salvage: organisation of fire service, fire alarm systems, &c., in large and small towns and in villages; employment of water-mains for fire extinguishing; construction of fire-engines and smaller fire appliances; the design and arrangement of the interior of fire stations; means for lessening damage caused by water; organisation of volunteer and paid salvage corps; life-saving apparatus for fire brigade use and self help; organisation of fire service in besieged towns. *Group* 3.—Special building construction: fire-proof materials and construction; planning construction of dwelling-houses; construction and interior arrangement of theatres, assembly-halls, hospitals, factories, and workshops; construction of warehouses. The Secretary of the Congress is M. Rieber, 176, Achterburgval, Amsterdam.

PUBLIC IMPROVEMENTS IN NEWCASTLE.—The improvements involved in the widening of Gallowgate, says the *Newcastle Chronicle*, are progressing rapidly, and already the thoroughfare presents an appearance completely different from that of a few months ago. The new baths and washhouses are well forward. On one side are the new workshops of Messrs. S. & C. W. Dixon & Co., and on the other a range of buildings is being erected by Mr. H. B. Wilson. Thus Gallowgate seems likely, with its continuation in Blackett-street, to form one of the best thoroughfares in the city. Other public buildings are advancing quickly. The new branch library, which the Mayor (Alderman Stephenson) has provided in Elswick-road, will, it appears, be completed and handed over to the Corporation within a week or two. The new police-station in Scotswood-road is also nearing completion; and the School Board has building operations going on in various parts of the city. There is a Presbyterian church building in Elswick-road, and another in Northumberland-road. Near the latter building is the hall which the Northumberland miners have built, and which they are to call after the name of Mr. Thomas Burt, M.P. Then there is going on the strengthening of the lantern-tower that surmounts the Cathedral of St. Nicholas. The interior of the Theatre Royal in Grey-street has been gutted and remodelled.

SURVEYORSHIP APPOINTMENT.—Mr. J. H. Jevons, Engineer and Surveyor to the Braintree Urban District Council, has been appointed to the Borough Surveyorship of Hertford. There were 122 candidates for the appointment, out of which six were selected to be interviewed by the Council.

VENTILATION OF HOSPITALS.—In the "Sanitary Chronicle" of the Parish of St. Marylebone, for July, Dr. A. Wynter Blyth, commenting on the lack of accommodation in the hospitals of the Metropolitan Asylums Board, says: "It is pretty clear that one of the chief causes of the decrease in the accommodation is the attempt to raise the cubic space per bed from 1,200 to 2,000 cubic feet. It is an acknowledged fact that hospital mortality has a definite relation to cubic space. Beds constantly occupied by patients with a cube of 800 ft. will not give such good results as beds with double that quantity of space, and twice 1,600 may even give still better results, so that you may go on until it comes to putting patients in a hammock under a Japanese umbrella in a field, which would

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Rectory	St. Nicholas (Galway) Select Vestry	10*l.* and 5*l.*	Sept. 25
*Sewerage and Water Supply Scheme	Linslade Parochial Committee	20 guineas & 10 guineas	Oct. 8

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Wagons and Carts	Torquay Town Council	H. A. Garrett	Sept. 9
*Saleshops, Offices, &c. Sheffield	Trus. late G. H. Foster	Flockton & Gibbs	Sept. 12
*Apparatus for Emptying Cesspools	Dartford R.D.C.	E. R. Boulter	Sept. 14
*Underground Telephones, &c.	Manchester Corp.	*Official*	Sept. 17
*Wood Paving	Fulham Vestry	C. Botterill	Sept. 18
*Alterations, Additions, &c. at Workhouse	Holborn Union	H. Saxon Snell	do.
*Additions to Schools at Acton	Acton School Board	Edward Monson	Sept. 19
*Road Materials	Southgate U.D.C.	C. G. Lawson	Sept. 20
*Corrugated Iron Building	Hendon U.D.C.	S. S. Grimley	Sept. 23

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Alterations, &c. Workhouse	Bethnal Green Guar.	G. E. Holman	Sept 24
*New Hospital and Reception Wards	Lancashire Asy. Bd.	Simpson & Duckworth	Sept. 28
*Town Hall and Public Offices	Hammersmith Vestry	H. Mair	Oct. 2

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Surveyor and Engineering Assistant	Stockton-on-Tees Corp.	120*l.*	Sept. 9
*Surveyor, &c.	Chippenham U.D.C.	120*l.*	do.
*Inspector of Nuisances	Colchester U.D.C.	100*l.*	Sept. 16
*County Surveyorship	Civil Service Commrs.		Sept. 18
*Mechanical Engineer	West Ham Council	200*l.* &c.	Sept. 28
*Borough Engineer's Assistant	St. Helen's Corp.	2*l.*	No date
*Draughtsman	do.	2*l.*	do.
*Teacher of Woodwork, &c.	Hove and Aldrington School Board	100*l.*	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv., vi., viii., *and* xviii. *Public Appointments, p.* xvi.

in dry summer weather give the best results of all. It has been noted in more than one epidemic of typhus in Ireland, that those who lay about the fields and on the road-sides recovered, while those who were treated in hospitals and in their own homes died. In hospital construction, however, there must be a limit to cubic space; if the cubic space is doubled the expense will be increased in the same proportion, or almost so. It appears to me that the matter is simply a problem in ventilation, and that theoretically it is not an impossibility to keep the atmosphere in a 1,000 ft. cube as sweet and pure as in a 2,000 ft. cube; in other words, that instead of increasing the cubic space, attempts should be made to so improve the ventilation of each bed area and bed space, that the air within is equal in quality to the air without. The majority of the St. Marylebone patients who are sent to hospital have at home not more than 400 cubic ft., and too often something like 250 cubic ft., hence should they be kept at home owing to the want of hospital accommodation, originally mild cases may become fatal, let alone the obvious evil of spread. The Vestry have urged the Asylums Board to utilise to the fullest extent their existing accommodation."

ARCHÆOLOGY IN MADRAS.—Mr. A. Rea, Superintendent, Archæological Survey, Madras, in submitting his programme of proposed survey operations for the year 1896-97, proposes to make a tour through the Salem District, and survey any remains which may be found to be of sufficient importance. Among the places which seem to him to require inspection are Krishnaghiri, Amaragendi, Kovilvellar, Nangappalli, Omalur, Pottipuram, Salappadi, Taramangulam, Argalur, Attur, Sankagiridurgam, and Kapliamalai. He also proposes to complete the survey of the great temples at Conjeeveram. This programme has been approved by the Government, subject to any orders which may be issued hereafter on the subject of the continuation of Mr. Rea's services after October next.—*Indian and Eastern Engineer.*

FREE LABOUR CONGRESS, NEWCASTLE.—The third annual congress of the National Free Labour Association is to be held at the Geographical Society's Hall, St. Mary's-place, Newcastle-on-Tyne, on October 7 and subsequent days.

LEGAL.

MORDEN COLLEGE *v.* LETHBRIDGE & PRIOR.

THIS was an action before the Official Referee, Mr. Verey, for dilapidations on property leased by Morden College, which lease expired Michaelmas, 1888. The claim was for 2,000*l.* The defendants paid 300*l.* into Court, which they pleaded was sufficient to cover the dilapidations existing at Michaelmas, 1888, having regard to the repairing covenant having the words "the reasonable use and wearing," limiting its force and also taking into account the class and construction of the houses. The hearing was on June 20, 21, 22, 24, and 25, and July 22 and 23 last. Mr. Gore Brown, instructed by Messrs. Reyroux, Phillips, & Co., appeared for Morden College. Messrs. Barnes Williams and Lawton R. Ford were the surveyors supporting the claim.

Mr. Reginald Bray and Mr. Bartley Dennis, instructed by Messrs. Lethbridge & Prior, appeared for the defendants. Professor Banister Fletcher, Mr. H. Phillips Fletcher, and Mr. C. Jones were the surveyors giving evidence for the defendants. The Referee has now given judgment for the defendants with costs.

ALLEGED INTERFERENCE WITH ANCIENT LIGHTS.

THE case of Lewis v. Rookwood came before Mr. Justice Mathew in the Vacation Court on Tuesday last, it being a motion for an injunction to restrain the defendant from interfering with the plaintiff's ancient lights.

Mr. Hopkinson, who appeared with Mr. Nepean in support of the motion, said that there was no dispute about the lights being ancient. The learned counsel stated that a building was in course of erection by the defendant which had already considerably darkened three ancient lights in the plaintiff's building.

His Lordship: What is said on the other side?

Mr. Marten, Q.C., said that the defendant had submitted plans to the plaintiff nearly a year ago, had modified those plans in accordance with the plaintiff's suggestions, had dug the foundations as long ago as last April, and the building had got up to a considerable height before any action was taken by the plaintiff. By the communications which took place between the parties, it was agreed that the defendant should go on with his building in the way he had done. Whatever the result of the case might be, there ought to be no damages.

His Lordship: I cannot dispose of the case that way. What do you arrange meanwhile?

Mr. Hopkinson: I must say that my learned friend's statement is not in accordance with the evidence.

Mr. Marten said that he was willing to submit to an undertaking to "pull down" after the trial, if so ordered.

After some further discussion, on the defendant giving an undertaking to "pull down" if ordered to do so at the trial, his Lordship made no order on the motion, except that the costs were to be costs in the action.

BUILDING DISPUTE IN THE VACATION COURT.

THE case of Rapley *v.* Clarke came before Mr. Justice Mathew, sitting as Vacation Judge, on Tuesday last, it being an application by the plaintiff for an order directing the defendant to pull down a building which he had erected. Counsel for the plaintiff said that since last week, when the case was before the Court, the defendant had actually and very substantially reduced the height of his building. He (the learned counsel) probably could not, on the facts as they stood, ask his Lordship to go into the matter then. The defendant had sworn that he did not intend to go higher than he had already.

After some discussion it was arranged by consent that his Lordship should grant an injunction restraining the defendant from building any higher than he had done at present till the trial of the action.

Defendant's counsel said that the defendant, in agreeing to those terms, must not be taken as admitting any liability whatever.

MEETINGS.

FRIDAY, SEPTEMBER 6.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Castell-Evans, F.I.C., on "Elementary Physics and Chemistry: Mechanical Physics."—I. 8 p.m.

Liverpool Engineering Society.—Visit to the Sunlight Soap-works at Bebington.

SATURDAY, SEPTEMBER 7.

Architectural Association.—Visit of the Camera Club to Winchester.

MONDAY, SEPTEMBER 9.

Clerks of Works' Association (Carpenters' Hall).—Monthly meeting, 7.30 p.m.

TUESDAY, SEPTEMBER 10.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Castell-Evans on "Elementary Physics and Chemistry: Natural Forces." II. 8 p.m.

FRIDAY, SEPTEMBER 13.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Castell-Evans on "Elementary Physics and Chemistry: the Atmosphere, its Physical Properties." III. 8 p.m.

SATURDAY, SEPTEMBER 14.

Architectural Association.—Visit to the Vyne, near Basingstoke.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

15,840.—WINDOWS: *W. Garland and another.*—This invention provides means for raising and lowering sash-windows without the aid of cords, weights, &c. Two screws are arranged vertically in the window-frame, and engage with nuts formed in two arms, which project laterally from the sash. By turning a handle, which is suitably connected by bevel-wheels, the screws are made to act in unison and lower or raise the top or bottom sash as required.

17,499.—COWLS: *F. Woodford.*—In cylindrical revolving cowls of the usual shape, the vertical vanes ordinarily employed are each furnished, in addition, with a lip at the inner edge, so as to afford a larger surface to the action of the wind. The lower part of the revolving body of the cowl is also furnished with a series of outlet-holes, every alternate one of which is provided with a suitably-curved guide-plate.

18,229.—TILES: *J. Peake.*—Relates to an improved appliance for making roofing-tiles of various angles by the use of one moulding-board. Two boards or leaves, suitably bevelled, are connected together by metallic or other hinges, and provided with wooden strips of different shape and thickness, which are adjusted by screws so as to be easily fixed and removed as required for various shapes of tiles.

1,058.—WATER-CLOSETS: *L. Swale.*—This invention deals with an improved siphon-cistern, which dispenses with the unpleasan noise caused by the ordinary siphon-cistern as used for water-closets, &c. The siphon is fixed in the cistern in the usual way, but is fitted, at the bend, with a tap and air-pipe, which is carried up above the water-level. The tap is actuated by an arm and ball, so that when the water falls to any required level the tap is turned and air admitted, which breaks the suction and prevents the usual noise caused by air rushing into the pipe. At the foot of the siphon a pipe and valve is connected and arranged to admit water for starting the siphon.

4,532.—WEDGES FOR DOORS AND WINDOWS: *R. Threlfall and another.*—A wedge, chiefly adapted for the bottom of doors, but may also be used for windows. Consists of a wedge-shaped piece of steel having two sharp projecting pieces on the bottom side at the thickest end. The top face has longitudinal grooves of a V shape. The mode of application will be easily understood.

9,024.—ASPHALTE: *J. Wetherill.*—For filling the joints of setts and pavings an asphalte is formed by adding fine sieved fresh slacked lime with pitch, tar, or creosote oil in a boiling state, so as to prevent it from the effects of cold and heat when in use.

11,930.—BRICKS: *H. Sadin.*—Consists in the employment of natural or calcined coal-schist, which is added to the clay in any proportion for the manufacture of bricks.

NEW APPLICATIONS FOR LETTERS PATENT.

AUGUST 19.—15,546, A. Scott, Fire-grate.—15,586, P. Lange, Rotary Brushes for Paperhanging.—15,599, M. Pellet, Ventilating.—15,606, W. Henderson, Horizontal and Vertical Saws.

AUGUST 20.—15,614, W. Mills, Holding Window-sash Frames and Preventing Shaking thereof.—15,619, J. Hampton, jun., Mitre-cutter and Corner Cramp Combined.—15,673, L. Baldwin, Sash Lock and Supports.

AUGUST 21.—15,712, W. Cawthorne, Improvements in Locks, Latches, &c., by Weighting the Latch-bolt.—15,763, R. Wagner, Partitions for Use in Tunnels.

AUGUST 22.—15,782, P. Purcell, Doors, Windows, &c.—15,821, J. Abbott, Combined Safety-valve and Water-tap.

AUGUST 23.—15,855, J. Coulthurst, Turn-tables for Turning over Earthenware Sanitary Pipes, &c.

AUGUST 24.—15,897, W. Blaber, Adjustable Connexion for Lead and Stoneware.—15,903, D. Griffiths, Wood-working Machine.—15,908, T. Pilkington and E. Bolton, Prevention of Sewer-gas, &c., arising from Grids or Sewers.—15,919, W. Evans, Draught-excluders for Doors.—15,949, E. Wynne, Countersinking Screws for Use in Wood, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

14,464, D. Simpson, Revolving Window-frame.—14,612, W. Craft and F. Mash, Stained Glass.—14,903, R. McKellar, Smoke and Ventilating Cowls.—14,951, A. Ashworth, Locks for Desks, Cabinets, &c.—15,016, J. Shuttleworth, Window or Sash Fasteners.—15,061, R. Allison, Sash Fasteners.—15,299, The Simplex Window Fittings Company, Limited, and P. Daw, Fastenings for Window-sashes, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

18,040, B. Phillipson, Drain Connexions. — 19,455, J. Stock and others, Syphon Flushing-cisterns.—20,103, T. Fawcett, Machines for Pressing and Thicknessing Bricks, &c.—7,825, T. Kemp, Socket to Drain and Soil-pipes.—10,047, J. Arnold, Drip Trap.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

AUGUST 15.—By *W. Bradly* (at Deptford): 105, 107, 111, 119, 121, 123, 125, and 129, Greenwich-rd., Greenwich, u.t. 13 yrs., g.r. 104*l.* 10s., 200*l.*; 4 and 5, Little Thames-st., f., r. 28*l.* 12s., 250*l.*

AUGUST 28.—By *Alfred Preece:* 51, Alderney-st., Pimlico, u.t. 38 yrs., g.r. 10s., r. 60*l.*, 450*l.*; 43, Moreton-pl., u.t. 36 yrs., g.r. 8*l.*, e r. 60*l.*, 350*l.*—By *W. W. Jenkinson:* 25 and 26, Hawthorne-st., Kingsland, u.t. 58 yrs., g.r. 8*l.* 8s., 360*l.*; 6, Hanover-st., Pimlico, u.t. 30 yrs., g.r. 7*l.*, 325*l.*

AUGUST 29.—By *Fuller, Horsey, Sons, & Cassell:* "Botolph Wharf," Lower Thames-st., City of London, f., area 15,023 ft., 52,050*l.*—By *Stimson & Sons:* 35, Avondale-rd., Peckham, f., r. 25*l.*, 380*l.*; 2 to 10 (even), Meeting House-lane, u.t. 79 yrs., g r. 30*l.*, r. 152*l.*, 1,220*l.*; 72, Ady's-rd., u.t. 80 yrs., g.r. 6*l.*, r. 30*l.*, 240*l.*; 3 to 6, Norman Villas, Dulwich, u.t. 64 yrs., g.r. 25*l.* 4s., r. 112*l.*, 890*l.*; 38, Southwark Pk.-rd., Bermondsey, u.t. 27 yrs., g.r. 4*l.* 8s., 205*l.*; 14, Camilla-rd., u.t. 41 yrs., g.r. 6*l.*, r. 39*l.*, 165*l.*; 7, Bampton-rd., Forest Hill, u.t. 72 yrs., g.r. 8*l.*, e.r. 52*l.* 10s., 400*l.*; 180, Beulah Hill, Norwood, u.t. 17 yrs., g.r. 6*l.* 5s., 180*l.*; 5, Crown Villas, f., r. 26*l.*, 200*l.*; 49, 53, and 55, Palace-rd., u.t. 63 yrs., g.r. 30*l.*, r. 99*l.*, 515*l.*—By *Newbon & Co.:* 34, Casella-rd., New Cross, u.t. 62 yrs., g.r. 5*l.*, r. 34*l.*, 305*l.*; 414, New Cross-rd., u.t. 33 yrs., g.r. 4*l.*, 335*l.*; 364, West Green-rd., Tottenham, u.t. 73 yrs., g.r. 5*l.* 5s., r. 32*l.* 10s., 220*l.*; 83, Hungerford-rd., Camden-rd., u.t. 65 yrs., g.r. 5*l.* 5s., r. 40*l.*, 300*l.*—By *Willis & Crouch:* 33 and 35, Southwark Pk.-rd., Bermondsey, u.t. 20 yrs., g.r. 6*l.*, r. 58*l.* 10s., 210*l.*—By *Douglas Young* (at West Worthing): 8 plots of land, Valencia-rd., West Worthing, f., 728*l.*; 20 plots of land, Tarring-rd., f., 1,788*l.*; 50 plots of land, Grand Av., f., 9,424*l.*; "Norbury House" and "Homeleigh," Down View-rd., f., 2,180*l.*; 3 plots of land, Down View-rd., f., 424*l.*; 4 plots of land, Mill-rd., f., 532*l.*; 2 plots of land, Windsor-rd., f., 255*l.*; 4 plots of land, Lansdowne-rd., f., 584*l.*; 2 plots of land, Boundary-rd., f., 300*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	ton	8/0/0 0/0/0
Teak, E.I.	load	10/0/0 16/0/0
Sequola, U.S. ft. cu		1/10 2/2
Ash, Canada load		2/15/0 4/0/0
Birch, do.		2/5/0 3/10/0
Elm, do.		3/10/0 4/15/0
Fir, Dantsic, &c.		1/15/0 3/10/0
Oak, do.		2/15/0 4/15/0
Canada		6/0/0 7/10/0
Pine, Canada red		0/0/0 0/0/0
Do. Yellow		2/15/0 5/0/0
Lath, Dantsic, fath		4/10/0 5/10/0
St. Petersburg..		5/0/0 6/10/0
Wainscot, Riga, &c., log		4/10/0 6/10/0
Odessa, crown		4/10/0 6/10/0
Deals, Finland 2nd & 1st std 100		7/0/0 8/10/0
Do. 4th & 3rd		7/0/0 8/0/0
Do. Riga		7/0/0 8/0/0
St. Petersburg, 1st yellow		9/10/0 12/0/0
Do. 2nd yellow		7/10/0 9/0/0
Do. white		8/0/0 9/10/0
Swedish		7/0/0 15/10/0
White Sea		7/10/0 15/0/0
Canada, Pine 1st		22/0/0 24/0/0
Do. do. 2nd		15/10/0 17/10/0
Do. do. 3rd, &c.		8/5/0 10/10/0
Do. Spruce, 1st..		9/0/0 10/10/0
Do. do. 3rd and 2nd		6/10/0 7/10/0
New Brunswick		6/0/0 7/0/0
Battens, all kinds		5/0/0 21/0/0
Flooring boards, sq., 1 in. prep, 1st		0/9/6 0/14/6
Do. 2nd		0/6/6 0/11/6
Other qualities—		0/4/6 0/7/6
Cedar, Cuba..ft.		/3 /4
Honduras, &c.		/3 /4½
Mahogany, Cuba		/3 /6
St. Domingo, cargo av.		/3 1/0
Mexican do. do.		/3 /4
Tobasco do. do.		/3½ /6
Honduras do.		/3½ /5½
Box, Turkey ton		4/0/0 15/0/0
Rose, Rio		7/0/0 12/0/0
Bahia		6/0/0 15/0/0
Satin, St. Domingo		0/0/5 0/1/0

TIMBER (*continued*).		
Satin, Porto Rico	0/0/6	0/1/6
Walnut, Italian	0/0/3	0/0/7

METALS.		
Iron—Pig, in Scotland	ton	2/7/3 0/0/0
Bar, Welsh, in London		5/12/6 5/15/0
Do. do. at works in Wales		5/2/6 5/5/0
Do. Staffordshire, in London		6/0/0 6/10/0
COPPER—British cake and ingot		50/15/0 51/5/0
Best selected		51/10/0 52/0/0
Sheets, strong		57/0/0 0/0/0
Chili bars		46/16/3 47/1/3
YELLOW M'TAL		0/0/4-5/16 0/0/4⅜
LEAD—Pig, Spanish	ton	11/0/0 11/2/6
English com. brands		11/2/6 11/5/0
Sheet, English, 6 lbs. per sq. ft. and upwards		12/0/0 0/0/0
Pipe		12/10/0 0/0/0
ZINC—English sheet	ton	18/5/0 0/0/0
Vieille Montagne		18/15/0 0/0/0
TIN—Straits		64/17/6 65/17/6
Australian		65/17/6 66/7/6
English Ingots		68/15/0 69/0/0
Banca		66/0/0 66/10/0
Billiton		65/10/0 65/15/0

OILS.		
Linseed	ton	20/5/0 20/12/6
Cocoanut, Cochin		23/15/0 24/0/0
Do. Ceylon		23/0/0 0/0/0
Palm, Lagos		22/15/0 0/0/0
Rapeseed, English pale		22/0/0 0/0/0
Do. brown		20/10/0 20/15/0
Cottonseed ref.		17/10/0 18/0/0
Oleine		20/10/0 21/10/0
Lubricating, U.S.		5/9/0 8/3/0
Do. black		4/6/0 6/6/0
TAR—Stockholm	barrel	0/19/6 0/0/0
Archangel		0/14/6 0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.*]

BLAENAVON (Mon.).—For the construction of reservoir, Forge Side, also brick service reservoir, for the Urban District Council. Mr. T. Dyne Steel, C.E., Skinner-street, Newport, Mon. Quantities by engineer:—

James Allen	£2,874	10	1
A Lawson & Co.	2,393	11	1
J. H. Burgoyne	2,306	0	0
T. Goldsworthy	2,280	9	6
Batchelor & Snowden	1,974	0	10
Baker & Gregory	£1,846	11	7
Sydney Lewis	1,518	4	6
W. L. Meredith	1,503	8	2
T. J. Davies	1,332	0	0

[Engineer's estimate, £1,611.

BAILDON.—For the various trades required in building a new boiler-house, engine alterations, new boilers, and other alterations, proposed to be carried out at Tower Holme Mills, Baildon, near Shipley, for Messrs. C. F. Taylor & Co. Mr. John Waugh, C.E., Sunbridge Chambers, Bradford:—

Masonry, Bricklaying, and all other Trades, for the erection of new Boiler-house, Economiser-house, Connexions to Chimney, with the exception of the Roof.

Frederick Ives	£846	Wm. Pitts & Sons	£677
A. Broxup & Son	775	James Bairstow, Shipley*	570
James Deacon	670		

* Accepted.

Alterations to Beam Engines.

J. & E. Wood	£2,033	Woodhouse & Mitchell, Brighouse (accepted)	£1,450
Pollit & Wigzill, Ltd.	1,725		

Two New Mild Steel Boilers, 120 lbs. working pressure, 8 ft. 6 in. by 30 ft. long, delivered and fixed on seats at Tower Holme Mills.

Hick, Hargreaves, & Co., Ltd.	£535	each boiler.	
Thos. Beeley	480	"	"
Spurr, Inman, & Co., Ltd., Calder Vale Boiler Works, Wakefield*	435	"	"
J. & J. Horsfield	425	"	"

* Accepted on account of delivery.

Wrought-iron Roof, &c., for Boiler and Economiser Houses.

Taylor & Parsons	£167
Hargreaves & Dewshirst, Sunbridge-road, Bradford*	142

* Accepted.

CHELTENHAM.—For the erection of two cottages, Barn Farm, Hardwicke, for the Corporation:—

James S. Leakey	£380	0	0
C. Malvern & Sons	297	0	0
J. G. Flory*	£239	7	4

* Accepted.

[All of Cheltenham.]

COVENTRY.—For new offices and factory for the Triumph Cycle Co., Ltd., Priory-street, Coventry. Mr. Herbert W. Chattaway, architect, Trinity Churchyard, Coventry:—

T. Johnson	£3,350	0	J. Isaacs	£3144	0
T. Lines	3,300	0	A. A. Wincott	3,130	0
C. Gray Hill	3,275	0	J. Worwood	3,130	0
R. Wootton	3,200	0	Liggins & Strong	3,011	16
Smith & Pitts	3,187	0	C. Garlick (accepted)	3,000	0
C. Haywood	3,185	0	Gowing & Ingram	2,820	0

COWBRIDGE.—For intermediate school and hostel for girls. Mr. R. Williams, architect. Quantities by architect:—

D. Davis	£2,830	Morgan & Evans	£2,661
D. Jenkins	2,800	W. Linaman, junr.	2,575
J. D. Williams	2,700	C. H. Cooksley	2,480
Williams & Thomas	2,690	John Morgan	2,426
D. C. Jones & Co.	2,689	Hatherly & Carr, Bristol*	2,297
W. Bowers & Co.	2,683		

* Accepted subject to modification.

DEWSBURY.—For pulling down and rebuilding chimney. Mr. John Waugh, C.E., Sunbridge Chambers, Bradford. Quantities by engineer:—

Wm. Scott & Sons	£762	17	6
Dawson & Lamb	575	0	0
James Overend	550	0	0
Mark Scott	416	0	0
Ellis Brooke	£380	0	0
A. Broxup & Son, Gt. Horton*	346	0	0

* Accepted subject to certain alterations.

FLEETHAM.—For rebuilding Kirkby Fleetham Lodge. Mr. J. M. Bottomley, architect, 28, Albert-road, Middlesbrough:—

Henry Richardson	£2,532	19	9
B. Mackenzie	2,295	15	0
Marshall France	2,262	14	0
Wm. Shaw & Son	2,236	11	0
Thos. Dickinson	2,178	0	0
Allison Bros.	£2,135	6	6
G. Mackenzie, Catterick (accepted)	2,103	2	0
G. R. Wade	1,953	11	1

HANLEY (Staffs).—For the erection of a pavilion (Contract No. 20). Messrs. T. H. Mawson and Dan Gibson, park architects, Windermere:—

Cornelius Cornes* £1,749

* Recommended by committee for acceptance.

[Architects' estimate, £1,735 9s. 4d.]

KIRKCALDY.—For the Adam Smith amd Beveridge Memorial Halls, Kirkcaldy, N.B. Messrs. James B. Dunn & Findlay, architects, 94, George-street, Edinburgh. Quantities by Messrs. Lorimer & Fairbairn, Edinburgh:—

Masonry Work.

	CORNCOCKLE STONE.		GRANGE STONE.	
	Snecked Rubble and Buttresses	Ashlar and Buttresses.	Snecked Rubble and Buttresses.	Ashlar and Buttresses.
	£ s. d.	£ s. d.	£ s. d.	£
Alex. Frazer, jun.	8,457 11 0	9,062 2 9	7,821 0 0	8,517
P. Sinclair & Son	7,676 11 0	8,354 11 0	7,101 3 6	8,349
J. & G. Menzies	7,048 9 10	8,287 13 1	6,131 2 7	7,103
G. Smith & Son, Kirkcaldy	7,000 0 0	7,660 0 0*	6,708 0 0	7,458

Carpenter and Joiner Works.

David Wishart	£3,998	Alexander Waddell, Burntisland*	£2,769
John Brock	3,388		
Matw. Wishart	3,098		

Plaster Work.

William Baird	£1,398	0	George Scott	£1,119	0
James Harper & Son	1,300	0	William Grant	987	0
John Easton	1,221	0	Rob. McGregor, Dunfermline*	894	9
William Ure	1,195	0			
James Annan	1,145	0			

Plumber Work.

Henry Hutchison	£539	John Torrance	£477
James Wood & Son	527	Burn & Baillie	459
D. Purves	499	Alex. Darling	452
Andrew Kirk	498	John Adams, Edinburgh*	448
James Macdonald	494	D. Blake & Co.	399

Gasfitter Work.

D. Purves & Co.	£184	Alex. Darling, Kirkcaldy*	£160
John Adams	175		

Slater Work.

David Stack	£374	Wm. Anderson & Son	£337
James Rodger	362	Rob. Graham	329
Thomas Steele & Son	350	Alex. Fergusson, Kirkcaldy*	327

Ironfounder Work.

Barnet & Morton	£237	P. Bell & Son	£199
Andw. Stoffert	201	Charles Robertson	193
P. & W. McLellan	200	Bladin & Co., Glasgow*	185
Thomas Gibson	199		

Accepted.

HARROGATE (Yorks.).—For the erection of new premises for Taylor's Drug Co., Ltd., of London and Leeds, at Beulah-street and Station Parade. Mr. John W. Dyson, architect, Newcastle-on-Tyne. Quantities by Mr. J. P. Allen, Grainger-street West, Newcastle:—

W. C. Tyrie	£3,756	0	0
Chas. Myers	3,287	0	0
Wm. Ives & Co.	3,158	5	5
Rhodes Bros., Shipley (accepted)	£3,053	15	2
Cross & Carter (for part of work only)	2,498	0	0

HIGH WYCOMBE. — Accepted for erecting residence and stabling, for Mr. T. Robinson. Mr. T. Thurlow, architect:—

G. H. Gibson £1,900

KENDAL.—Accepted for the erection of three houses, for the Co-operative Society. Mr. John Hutton, architect, Kendal. Quantities by architect:—

Masonry, Walling, and Slating.—James Howie
Joinery.—Henry Collett
Plastering.—Benj. Davis
Plumbing, Painting, and Glazing.—Wm. Jackson
} Total, £550.

[All of Kendal.]

LANCASTER.—For the erection of school buildings, Marsh, for, the School Board. Mr. Robert Walker, architect, Church-street, Lancaster:—

Masonry and Walling.—R. Thompson, Lancaster	£1,590	0	0
Joinery.—Hatch & Son, Lancaster	420	0	0
Plumbing and Glazing.—Abbott, Lancaster	162	10	0
Plastering and Slating.—T. Liver, Lancaster	240	0	9
Painting.—Eaton & Bulfield, Lancaster	24	1	8

LOCKSBOTTOM (Kent).—For new laundry at Locksbottom, near Farnborough, Kent, for the Guardians of the Bromley Union. Mr. John Ladds, architect. Quantities by Mr. G. Boxall:—

Mid-Kent Building Co.	2,395	Trueman	£2,115
Skinner	2,270	Gray	2,095
D. Payne	2,244	J. Otway, Chislehurst*	2,079
Podger & Son	2,195	Duthoit	2,063
Tyme & Duncan	2,146	Burden	1,990

Accepted.

LONDON.—For the erection of a studio at No. 38, Abbey-road, St. John's Wood. Messrs. Inman & Jackson, architects, 7, Bedford-row, W.C.:—

Myring & Co.	£249	0	Phillips & Son	£235	0
Wm. Melbourne	244	10	Rubar dt & Son	228	5

LONDON.—For the exterior painting of Greystock-place Board School, for the School Board for London. Mr. T. J. Bailey, Architect:—

Harrison & Spooner	£127	0	Johnson & Co.	£112	5
Willmott & Son	125	0	Hornett (accepted)	99	0
Dove Bros.	121	0	Crig	92	0
Marchant & Hirst	114	0	Rowe	67	0

LONDON.—For the exterior painting of Gloucester-grove Board School, for the School Board for London. Mr. T. J. Bailey, Architect:—

Sealey	£244	0	0
James	152	13	9
Lathey Bros.	135	0	0
Stimpson & Co.	130	0	0
Polden	£116	0	0
Marchant & Hirst	97	0	0
W. Brown	95	0	0

LONDON.—For the interior painting of East-lane Board School, for the School Board for London. Mr. T. J. Bailey, Architect:—

Wood & Co.	£426	0	0
Harrison	348	16	9
Garrett & Son	333	0	0
H. J. Williams	£258	0	0
Marchant & Hirst	249	0	0

LONDON.—For exterior painting of Fleet-road Board School, for the School Board for London:—

Hornett	£241	0	Cowley & Drake	£173	15
Sparks	216	10	Marchant & Hirst	169	0
Chapell	198	10	Vernall & Davies	160	0
Cruwys	195	0	Eady	157	0
Callow	191	12			

LONDON.—For interior painting of Albion-street Board School for the School Board for London. Mr. T. J. Bailey, Architect:—

H. J. Williams	£368	Marchant & Hirst*	£275
Patrick	361	Kirby & Chase	209
Down	325		

* Accepted.

LONDON.—For exterior painting of Sherbrook-road Board School, for the School Board for London:—

G. Neal	£157	0	R. & A. Hill	£137	0
Hornett	148	0	Marchant & Hirst	129	0
Polden	147	0	Christie	86	10

LONDON.—For alterations and repairs at 23, Carlton Hill, St. John's Wood:—

Jauncey & Co.	£335	0	0
Calingham	298	0	0
Yerbury	£278	13	0
W. Melbourne*	246	7	6

* Accepted.

LONDON.—For the rebuilding of No. 27, New Bridge-street, E.C., for the Hand-in-Hand Insurance Society. Mr. Robert Willey, architect and surveyor, 33, New Bridge-street, E.C. Quantities by Mr. A. Howard, The Outer Temple, E.C.:—

Woodward & Co.	£6,629	Patman & Fotheringham	£5,922
Dove Bros.	6,280	Ashby & Horner	5,890
Hall, Beddall, & Co.	6,172	Trollope & Sons	5,820
Holliday & Greenwood	6,047	Colls & Sons	5,666

LONDON.—For the erection and completion of No. 12, Pitt-street, W., for Mr. William Clark. Mr. G. Gordon Stanham, architect, 100B, Queen Victoria-street, E.C.:—

Patman & Fotheringham	£1,451	John Appleby	£1,349
Adamson	1,435	Killby & Gayford	1,287
F. & H. F. Higgs	1,413	Turtle & Appleton	1,194

MASBOROUGH (Yorks.).—For the erection of manager's house, Treeton, for the Masborough Equitable Pioneer Society, Ltd. Mr. E. Winder, jun., architect, Wharf-street, Sheffield:—

R. Snell	£240	0	C. Green	£202	6
Pinder Bros.	226	10	G. Earnshaw, Rotherham (accepted)	199	10
W. & A. Greenwood	216	0			

MENSTON (Yorks.).—Accepted for the erection of a house, Burley-road. Mr. Fredk. Wild, architect, 7, Charles-street, Bradford:—

Masonry.—Mark Cowling, Menston	£342	14	9
Joinery.—Scott Bros., Menston	140	0	0
Plumbing.—J. E. Harland, Bradford	66	10	0
Plastering.—J. F. Walsh, Guisley	32	10	0
Slating.—Hill & Nelson, Bradford	26	17	0
Painting.—Bilton & Bowden, Menston	10	10	0

NARBOROUGH.—For the erection of two villa-residences at Narborough, for Mr. Joseph Guy Simpkin, from quantities and under the superintendence of Messrs. Simpson & Harvey, architects and surveyors, Alliance Chambers, Horsefair-street, Leicester :—

J. & H. Herbert	£2,755 0	J. O. Jewsbury	£2,433 0
Hutchinson & Sons	2,530 0	J. E. Johnson	2,359 0
Samuel Lord	2,500 0	Halford & Sons, Blaby*	2,345 6
Chas. Wright	2,462 10		

* Accepted conditionally.

NEWPORT (Isle of Wight). — For constructing precipitating tanks at the Isle of Wight Union. Mr. John I. Barton, engineer, Ryde :—

J. Whitewood £118
O. James, Haven-street, Ryde* 105

Gas-engine and Pumping Plant.

Jewell & Sons, Winchester* £285

* Accepted.

STANNINGLEY.—For the various trades required in building a new engine-house and engine foundation, raising of weaving-shed roof, and other alterations proposed to be carried out at Stanningley, for the Trustees of the late Samuel Varley. Mr. John Waugh, C.E., Sunbridge Chambers, Bradford :—

Engineering Work.

Davy Paxman	£2,539	Woodhouse & Mitchell	£1,616
Hick, Hargreaves, & Co.	2,280	Buckley & Taylor, Oldham*	1,602
J. & E. Wood	2,091	T. Atkinson	1,577
Pollitt & Wigzill	1,987	Wood Bros.	1,570
Yates & Thorn	1,800	Roberts & Co.	1,550
Cole, Marchant, & Morley	1,725	Marsden & Co.	1,400

* Accepted on their guarantee to have engine running by November 1, 1895.

Masons' Work and Bricklayers' Work.

J. Laycock	£1,065 11	J. Deacon	£1,467 0
W. Barrand	1,695 0	G. A. Walker	1,445 0
Humphreys & Moulson	1,630 0	A. Broxup & Son, Great Horton*	1,305 0
A. Braithwaite	1,580 0	J. Ambler	1,300 0
Appleyard Bros.	1,538 0		

Joiners' Work.

J. B. Mann	£1,071 15 0	Crabtree & Thornton, Bradford*	£800 12 5
Appleyard Bros.	970 0 0	J. Deacon	745 0 0
Wilkinson & Dawson	921 0 0		
J. Moulson & Sons	848 10 0		

Ironfounders' Work.

J. Butler & Co.	£1,325 0 0	Taylor & Parsons	£968 0 0
Clay, Henriques, & Co	1,123 10 0	E. & W. H. Haley, Bradford*	964 0 0
W. Rushton	1,099 0 0	J. Cliff & Co.	956 1 2
J. Bagshaw & Sons	1,080 17 6	Roberts & Co.	891 10 0

Plumbers' Work.

Brook, Walker, & Pitchers	£611 17 0	A. Higginbotham	£493 16 0
R. Townend	534 0 0	J. E. Bedford, Chapel Allerton, Leeds*	471 0 0
J. Stansfield & Son	533 12 9	H. Lindley	458 0 0
J. Snowden & Son	514 0 0	L. Conyers	433 10 0

Plasterers' Work.

Cordingley & Sons	£245 0 0	J. Leman	£228 19 8
J. Laycock & Son	240 0 0	B. Dixon & Co.*	217 18 6

Painters' Work.

J. Shuttleworth	£245	J. Snowden & Son	£107
J. Butler	118	G. R. Smith, Stanningley*	100
A. Higginbotham	109	D. E. Hutton	80

Slaters' Work.

Hill & Nelson	£254 0	F. Thompson, Stanningley*	£210 0
Pickles Bros.	251 0	J. Smithies	198 10

* Accepted.

TRING.—For the erection of Sunday-school buildings, New Mill, for the trustees. Mr. Wm. Huckvale, architect, Tring. Quantities by the architect :—

Henry Flint	£827	Ed. Wright	£791
D. Osborn	824	H. Fineter	748
G. H. Wheeler	800	J. Honour & Sons, Tring (accepted)	735
E. Smith & Sons	795		

WOLVERHAMPTON.—For erecting conservatory for West End Park, the gift of the Floral Fêtes Committee. Messrs. T. H. Mawson and Dan Gibson, architects, Windermere :—

Brickwork.—Gough, Wolverhampton £350
Horticultural builder 966
For extra boiler 50

Total £1,366

[Architect's estimate, £1,400.]

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G. H. W. (amount should have been stated).

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Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

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Registered Telegraphic Address, 'THE BUILDER, 'LONDON.

THE INDEX, with TITLE-PAGE, for Volume LXVIII. (Jan. to June, 1895) was given as a supplement with the number for July 13.

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QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.

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LARGE STOCK READY.

Particulars on application.

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LIVERPOOL:
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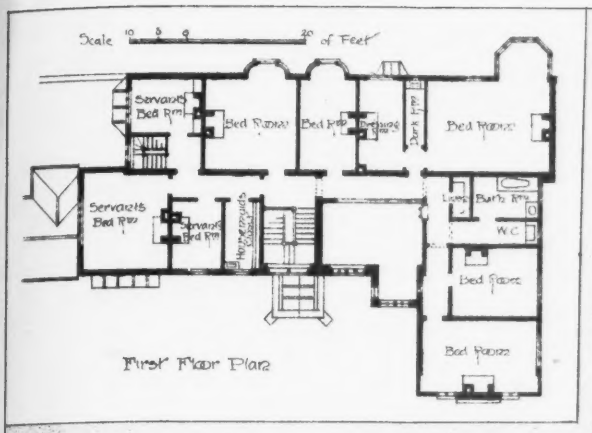
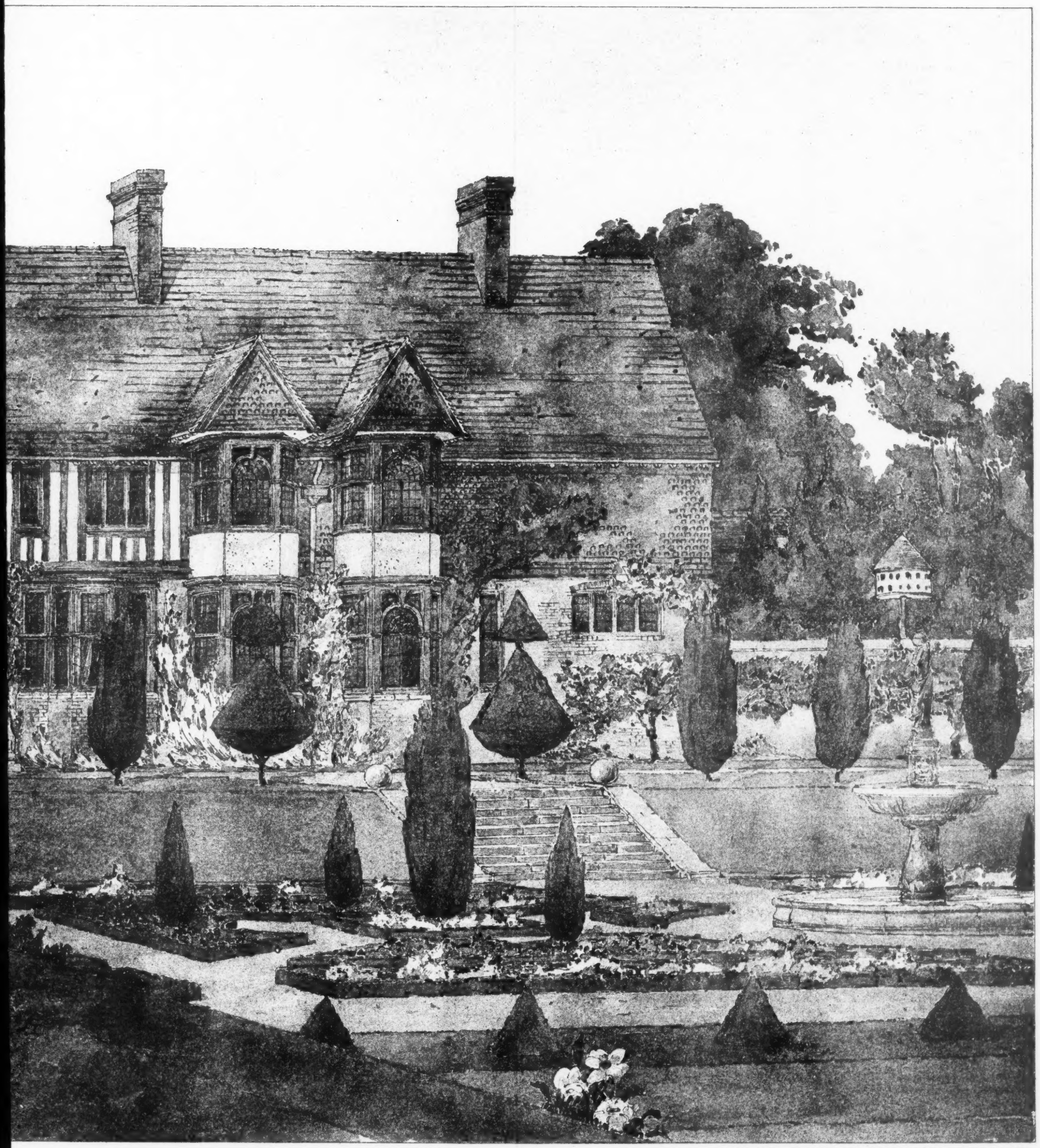
GLASGOW:
47 and 49, ST. ENOCH-SQUARE.

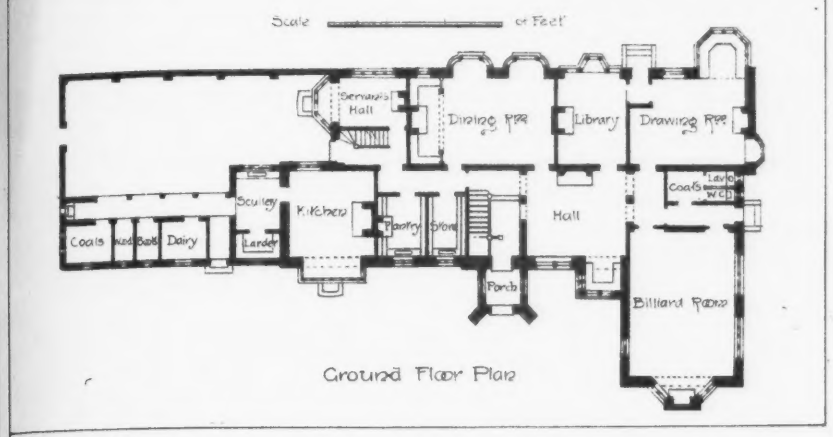


HOUSE AT OXTED: GARDEN FRONT.—Mr. R. A. Brigg



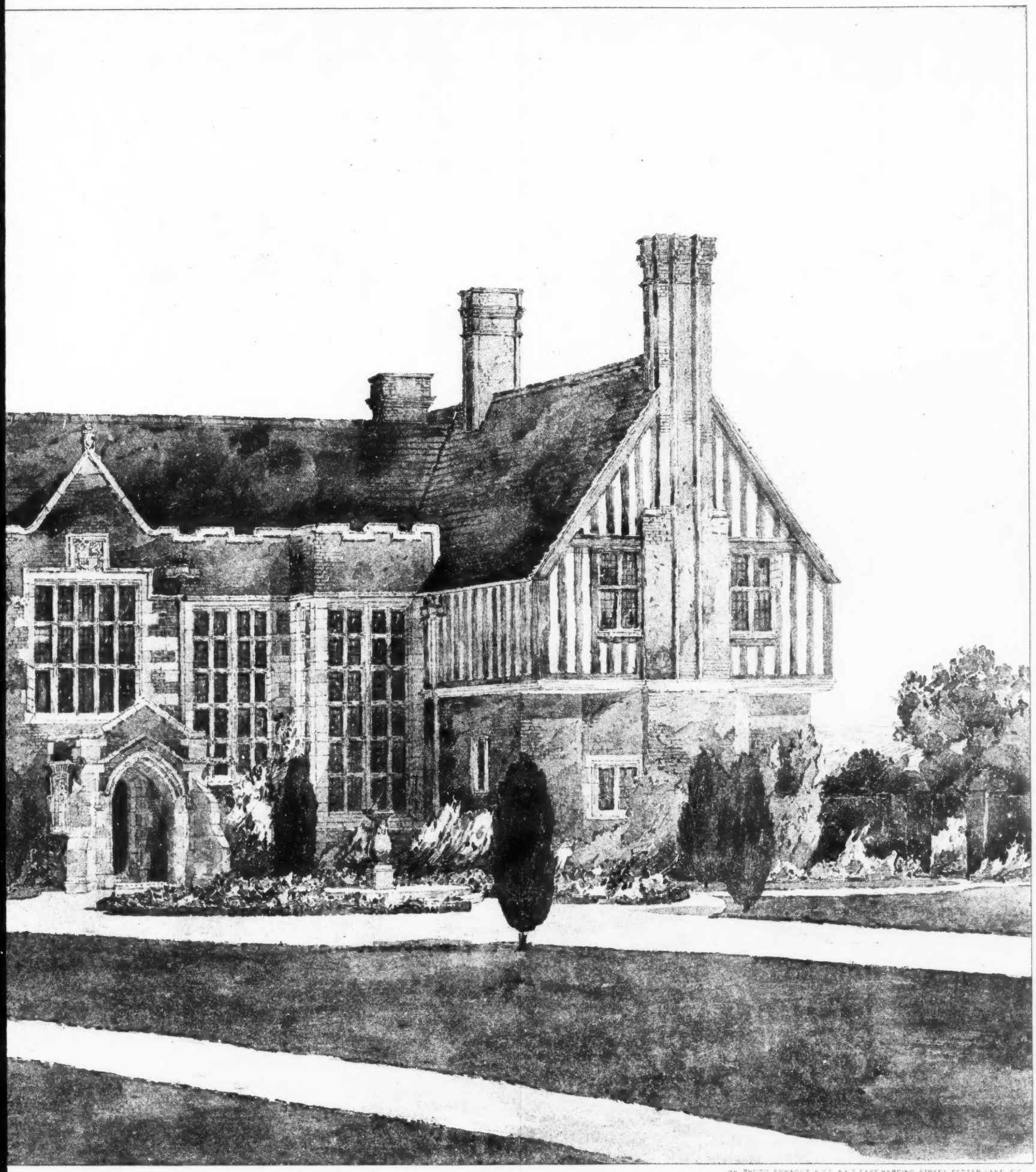
INK-PHOTO, SPRAGUE & Co. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

ED: GARDEN FRONT.—Mr. R. A. Briggs, F.R.I.B.A., Architect.



Ground Floor Plan

HOUSE AT OXTED: ENTRANCE FRONT.—Mr. R. A. Bri



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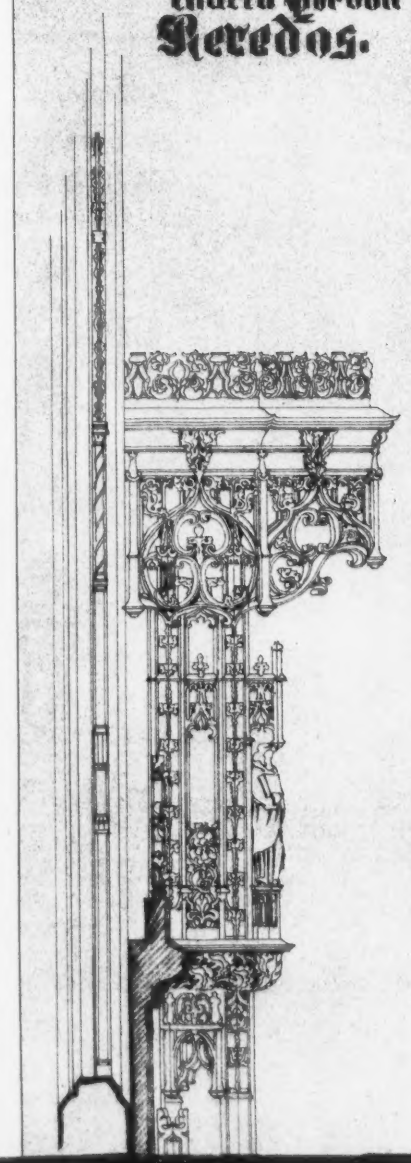
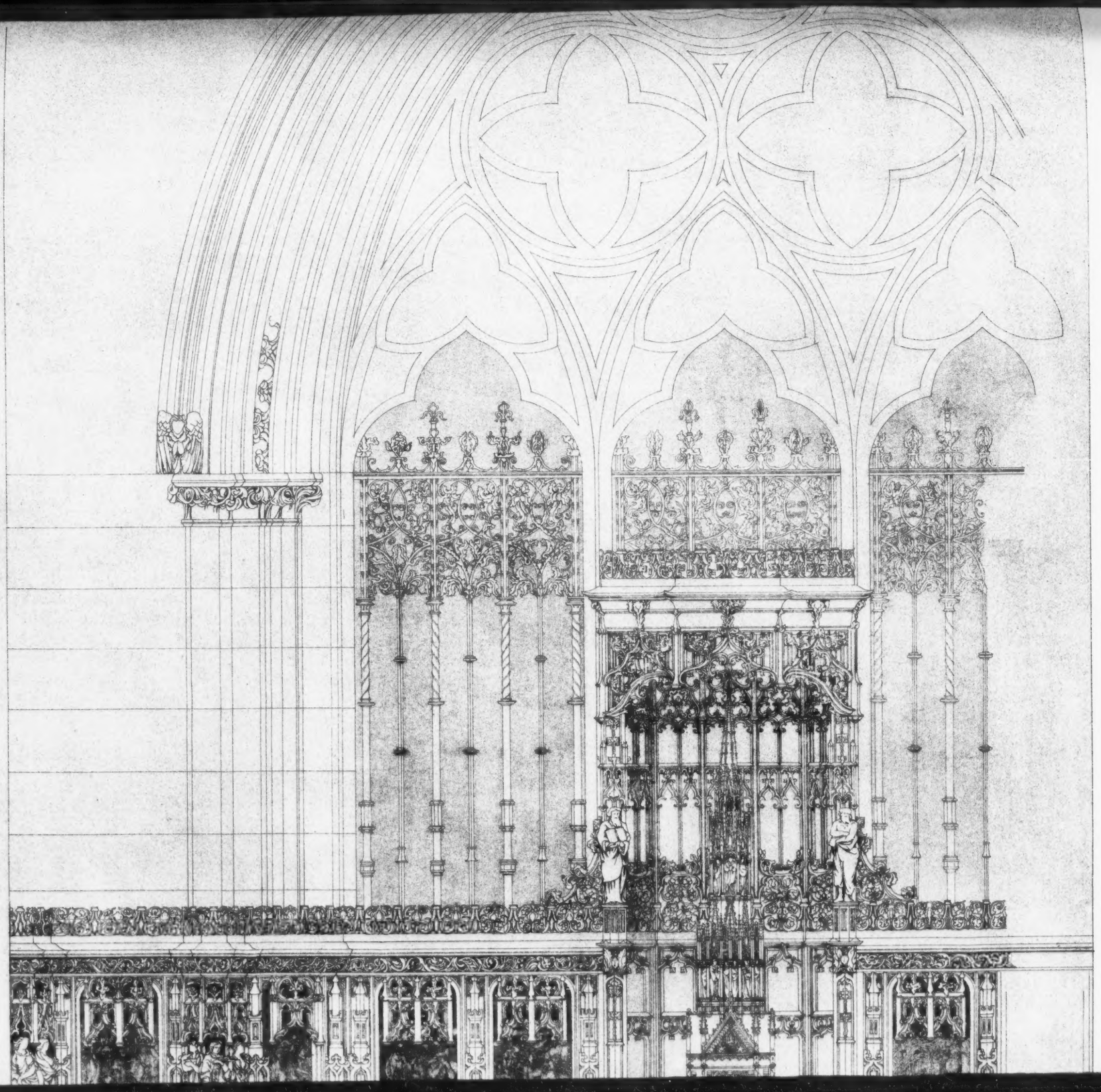
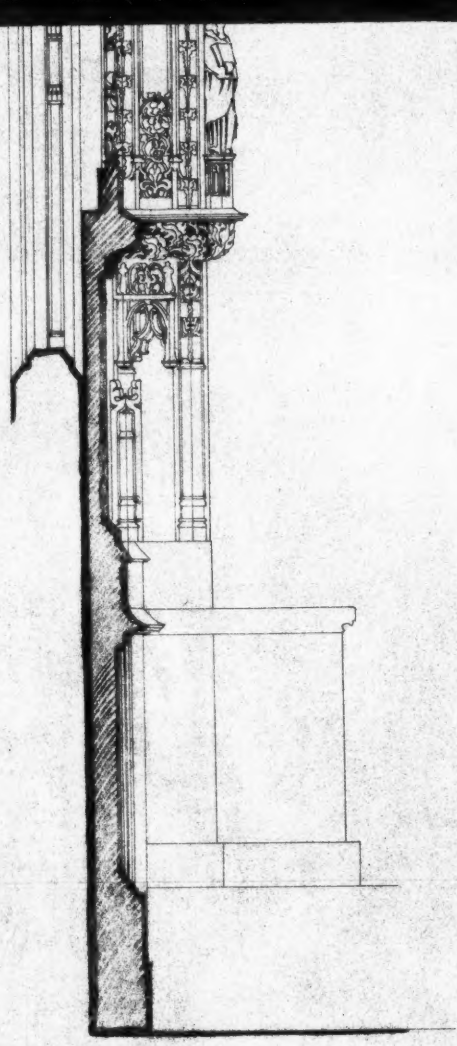
ENTRANCE FRONT.—Mr. R. A. Briggs, F.R.I.B.A., Architect.

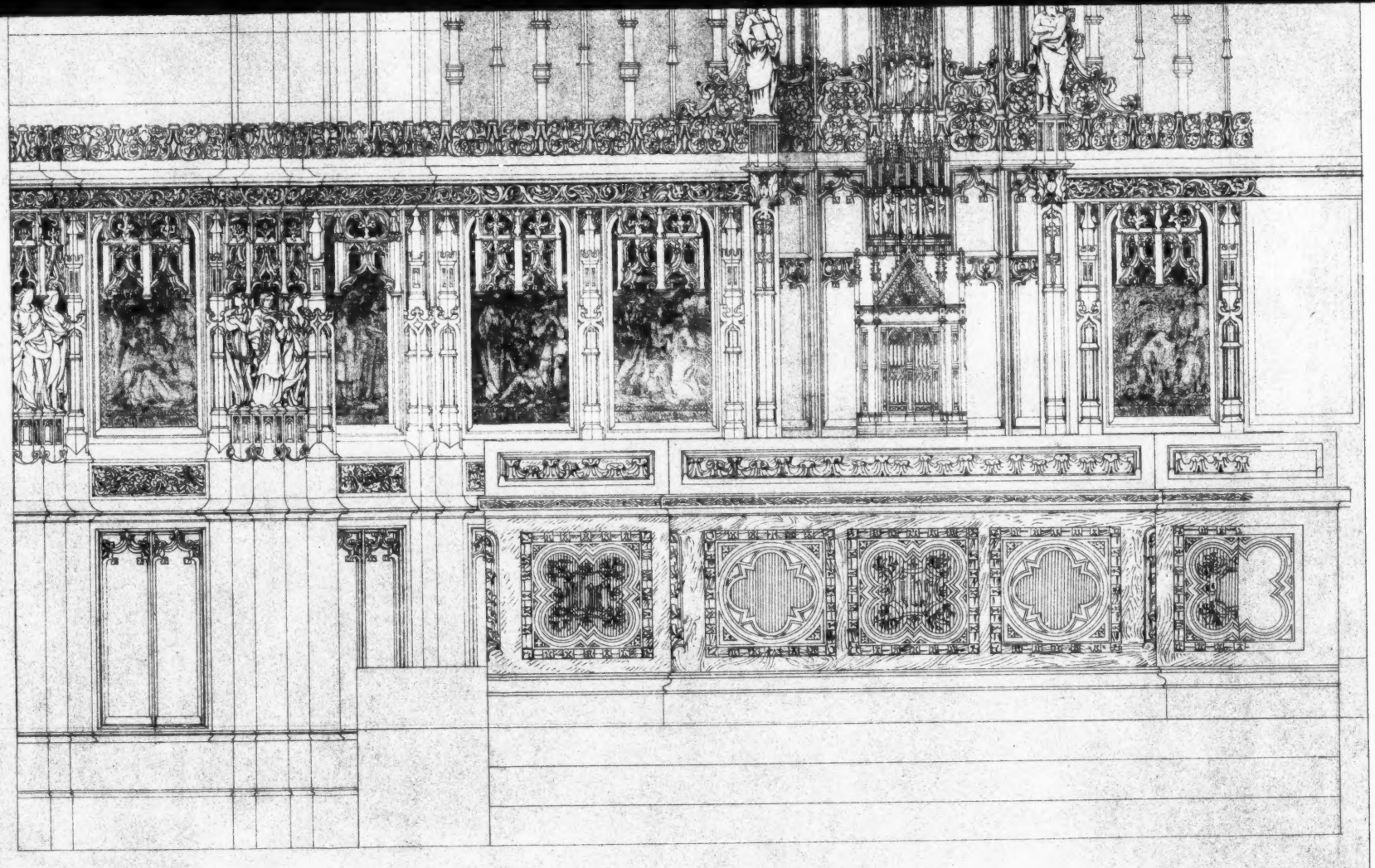
Catholic Apostolic
Church Gordon Sq.
Reredos.



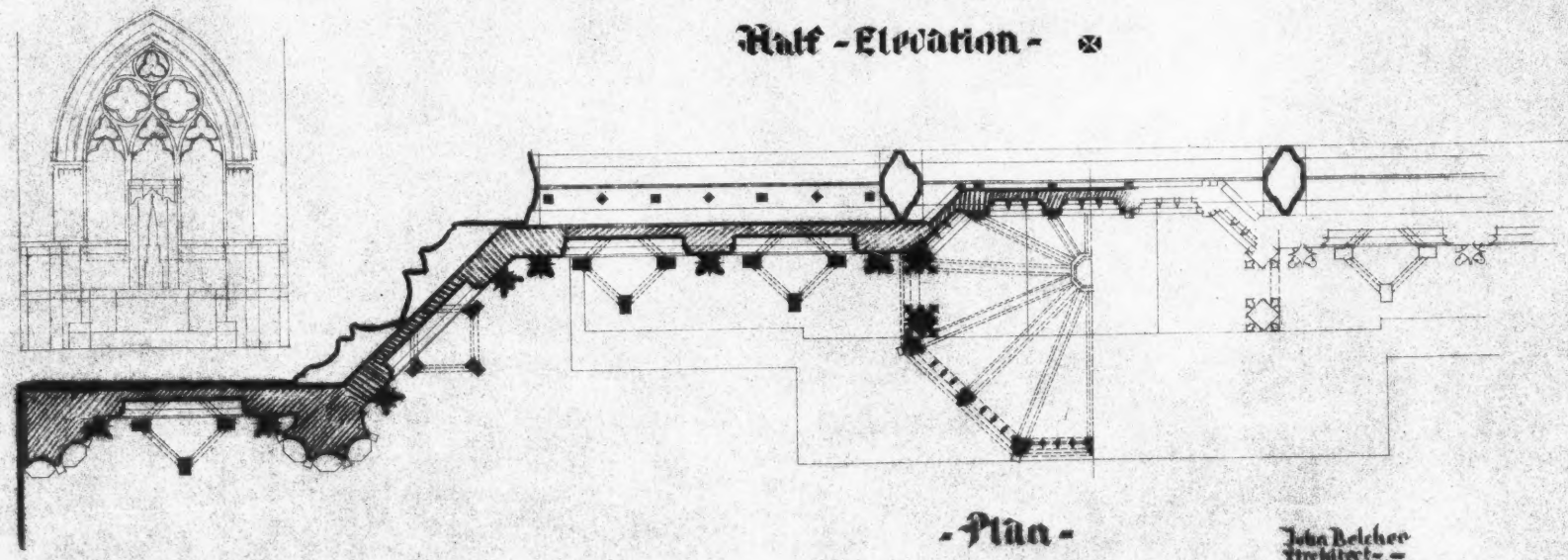




Section.



Half - Elevation -



- Plan -

John Belcher
Architect
11 Hanover Sq
London W

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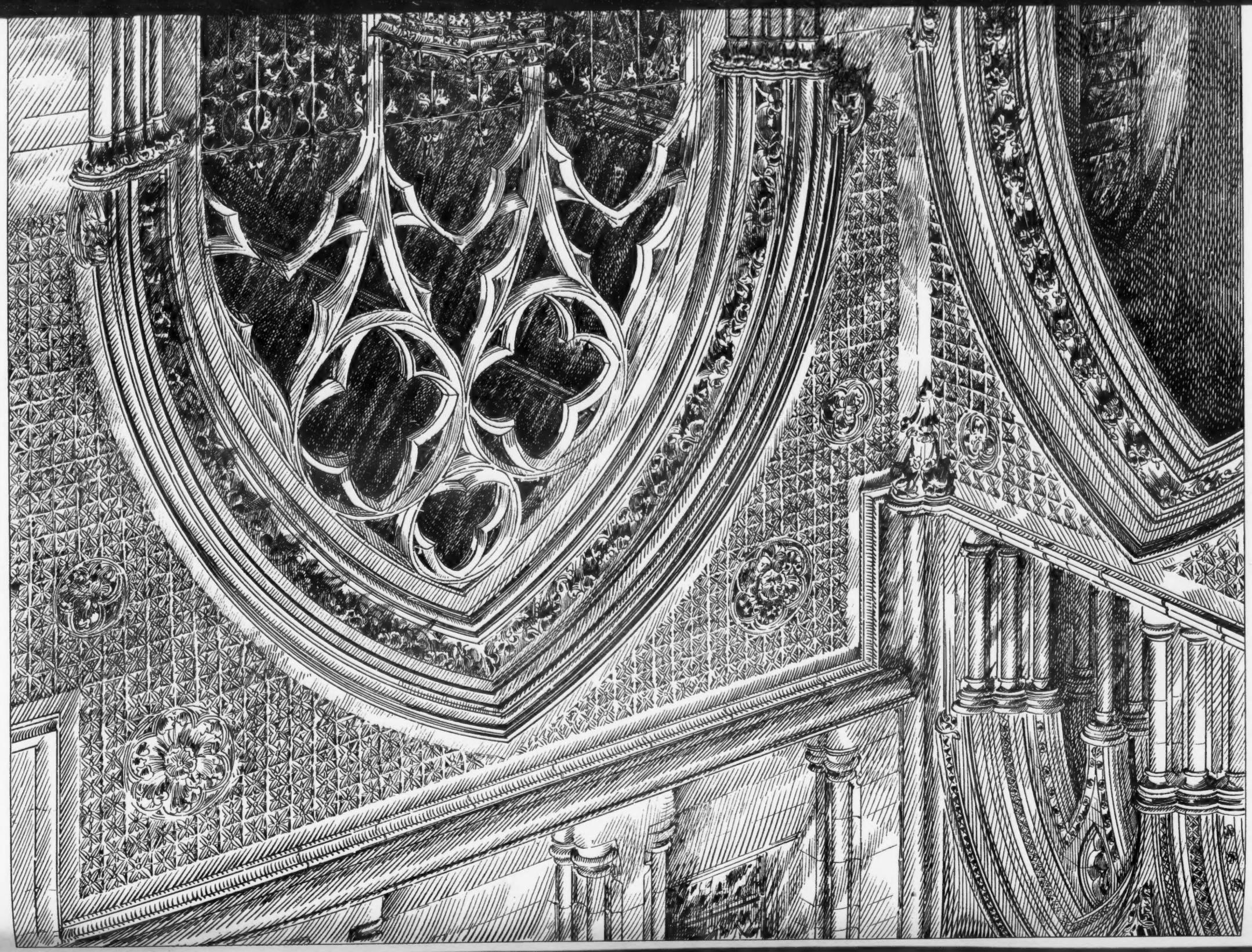
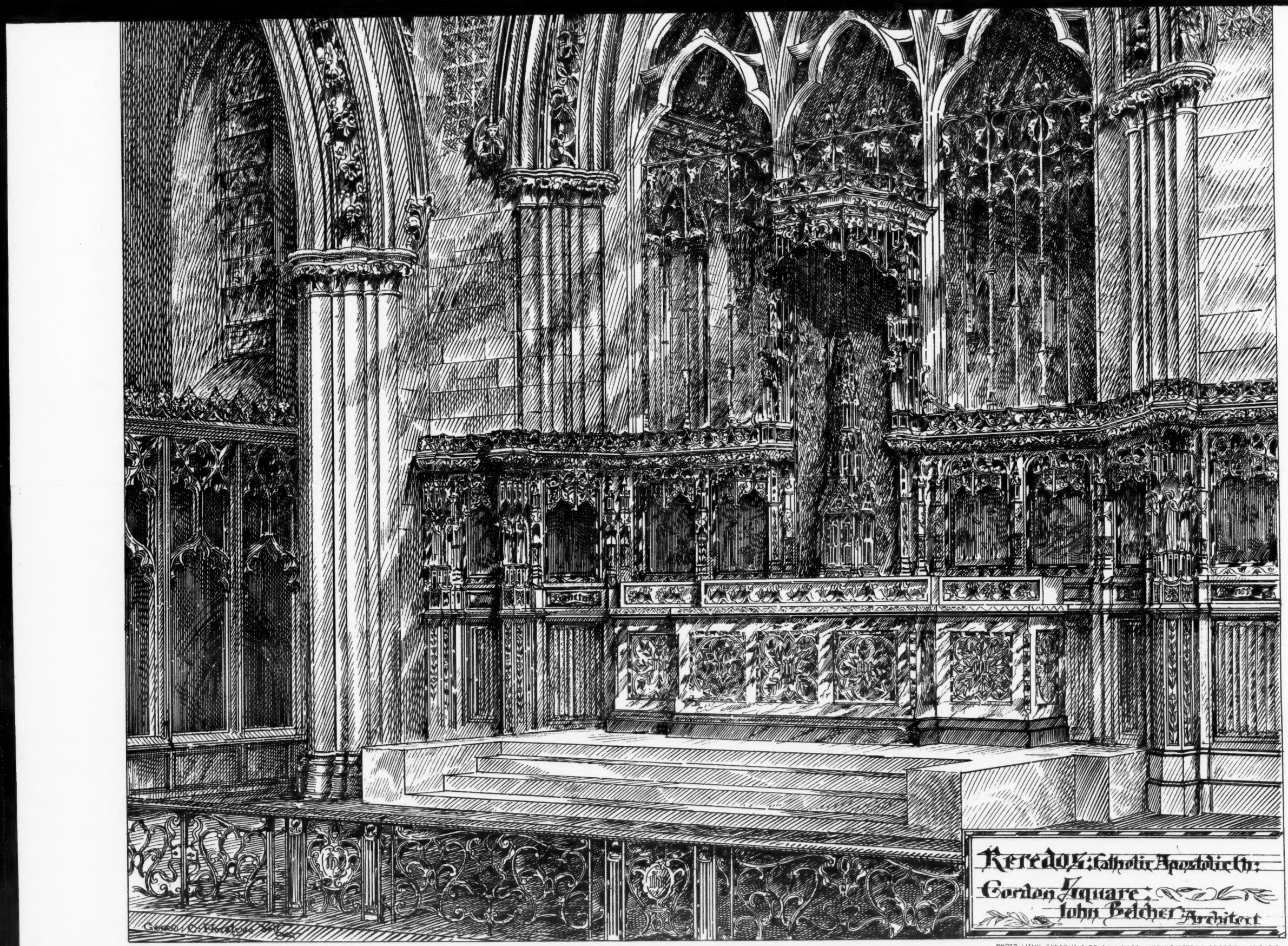
12 6 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Scale of feet.





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